

File No. 5/38/2013-14/RT

भारत सरकार / Government of India

नवीन एवं नवीकरणीय ऊर्जा मंत्रालय / Ministry of New and Renewable Energy

(ग्रिड संबद्ध सौर रूफ टॉप, सौर शहर एवं हरित भवन प्रभाग)

(Grid Connected SPV Rooftop, Solar Cities & Green Buildings Division)

Block No.14, CGO Complex,
Lodi Road, New Delhi-110003,Dated: 19th September, 2014

To
Managing Director,
Solar Energy Corporation of India,
D-3, A-Wing, First Floor,
Religare Building, District Centre,
Saket, New Delhi – 110017

Subject: Approval of Central Financial Assistance (CFA) to Solar Energy Corporation of India (SECI) for Installation of Grid Connected Rooftop Solar Photovoltaic Power Plants with aggregate 73 MWp capacity in the Warehouses in various States across the Country on Pilot Basis under National Clean Energy Fund (NCEF).

Sir,

With reference the minutes of the 10th meeting of the Inter Ministerial Group (IMG) constituted by D/o Expenditure, Ministry of Finance, Govt. of India, to approve/appraise the projects under the National Clean Energy Funds conveyed to this Ministry vide letter no. 3/04/PF-2/2014 dated 29th May 2014 and this Ministry's proposal submitted vide no. 5/75/NCEF 4/2013-14/RT dated 13.03.2014, I am directed to convey approval of President of India for total CFA of Rs. 140.44 crore to Solar Energy Corporation of India (SECI) for Installation of Grid Connected Rooftop Solar Photovoltaic Power Plants with aggregate 73 MWp capacity in the Warehouses in various States across the Country on Pilot Basis under National Clean Energy Fund (NCEF). This sanction is conveyed, including utilization of funds for the field visits, technical guidance, inspection IT enabled monitoring and evaluation, publicity orientation, awareness programme, trainings site visits of stakeholders, inspection monitoring etc. for SECI as per following breakup:

Sl. No.	Item/Component	Estimated Cost
(i)	Estimated Central Financial Assistance (CFA) of total 73 MWp plants @ total 73 MWp plants @ ₹ 2.00 crore/ MWp	₹ 146 crore
(ii)	2% towards field visits, technical guidance, inspection IT enabled monitoring and evaluation publicity orientation, awareness programme, trainings site visits of stakeholders, inspection monitoring etc.*	₹ 2.92 crore
	Total	₹148.92 crore

*This fund will be utilized in consultation with and as per direction of MNRE.

2.0 The individual project will range from 500 kWp to 5.00 MWp size. The projects will be implemented in the warehouses owned by various organizations like Warehousing Corporation of India, Food Corporation of India, State Government organizations and some private companies which have huge vacant roof space and vacant land in / around their warehouses.



3.0 The actual cost of these projects should be firmed up through open competitive bidding by SECI. The SECI will submit cost of the project along with copy of the work orders, completion report of the projects, utilization certificate and Audited Statement of expenditure and the details of interest accrued to MNRE. **The locations/distributions of the projects will be finalized in consultation with MNRE for which the approval will be given separately.**

4.0 Solar Energy Corporation of India is an established section 8 Company under the Company Act, for promotion of Solar Energy under Jawaharlal Nehru National Solar Mission (JNNSM).

5.0 SECI will follow all the terms and conditions and guidelines contained in the proposal approved by NCEF and the guidelines given in **Annexure**. The duration of implementation of the project is 18 months. The funds towards CFA will be released as soon as received from the Department of expenditure under NCEF during 2013-14, commensurate with the progress of work.

6.0 SECI will maintain and present their annual accounts in the standard format as required under GFR 209 (xiii). These accounts shall be open for inspection by the sanctioning authority and audit, both by the Controller and Auditor General of India under the provision of C& AG (DPC) act, 1971 and internal audit party by the Principle Accounts Office of the Ministry whenever called upon to do so.

7.0 The related expenditure will be debitible to Demand no 69, Major Head 2810- New and Renewable Energy, Sub Major Head-00, Minor Head 101- Grid interactive and Distributed Renewable Power, Sub Head 02- off grid/Connected and Distributed and Decentralized Renewable Power, Detailed Head 04, Object Head 31 Grants –in –Aid during the year 2014-15 out of the funds received under NCEF. Financial sanction will be issued separately after concurrence and receiving of budget allocation and in accordance with the requirements of funds.

8.0 This issues in exercise of the powers conferred on this Ministry and with the concurrence of IFD dated 12.09.2014 vide their Dy. No. IFD/709/2014-15 dated 22.07.2014. This sanction order has been noted at Sl. No. 4 Page No. 26 in the Register of grants for 2014-15.

9.0 This issues with approval of the competent authority.

Yours faithfully,



(Dr. Arun K Tripathi)

Director/Scientist 'F'

Telefax: 011-24363035,

E-mail: aktripathi@nic.in

Copy to :-

1. The Principal Director of Audit, CW&M - II (Scientific Deptt.) DGACR Building ITO, New Delhi.
2. The Principal Director (Local Bodies Accounts) or Director (Local Bodies), Office of the Comptroller and Auditor General of India, 9, Deen Dayal Upadhyaya Marg, New Delhi – 110 002
3. The Accountant General, Govt. of Delhi
4. MD/Director (Ashvini Kumar)/ Director (Rakesh Kumar) of, Solar Energy Corporation of India, D-3, A-Wing, First Floor, Religare Building, District Centre, Saket, New Delhi – 110017.
5. Heads of all SNAs with request that they may approach the Solar Energy Corporation of India to raise their requirements for Grid Connected SPV Rooftop plants in the Warehouses situated in their States.
6. JS&FA/ DS (F)/ US(F)
7. JS(TK)/Dir(GP)/ Sci B (HCB)
8. Cash Section (2 copies)
9. Guard File/Spare Copies



(Dr. Arun K Tripathi)

Director/Scientist 'F'



**Memorandum to Invite Proposals under
National Clean Energy Fund for Consideration of the Inter Ministerial Group Constituted
to Approve/Appraise Projects**

1.	General	
1.1	Name of the Project	Installation of Grid Connected Rooftop Solar Photovoltaic Power Plants with aggregate 73 MWp equivalents capacity in the Warehouses
1.2	Type of Project (Renewables/ Replacing existing technology/ infrastructure/ Pollution Control/ Pilot/Other (pl. specify)	Pilot Projects on Grid Connected Solar Rooftops on Renewables
1.3	Location (State/District/Town)	In the warehouses of Government / Commercial/ buildings located throughout the country
1.4	Administrative Ministry/ Department	Ministry of New and Renewable Energy (MNRE)
1.5	Name of Sponsoring/ Collaborating Authority	Warehousing Corporation of India, Food Corporation of India, State Government organizations and some private companies having huge vacant roof space and vacant land in / around their warehouses.
1.6	Name of the Implementing Agency	Solar Energy Corporation of India (SECI)
2.	Project Description	
2.1	Brief description of the project	<p><u>Background</u></p> <p>There are a large number of warehouses owned by various organizations like Warehousing Corporation of India, Food Corporation of India, State Government organizations and some private companies which have huge vacant roof space and vacant land in / around their warehouses. Unlike industry and commercial organizations they do not require much power for their own needs. Most of these warehouses are in States like Punjab, Haryana where cost of land is very high and, therefore, this rooftop space can be very well utilized.</p> <p>Owners of these godowns are willing to get the space for putting up solar as long as the buildings are not damaged and they get some income. The Distribution Companies (DISCOMS) will be willing to buy this power to meet their Renewable Purchase Obligation (RPO) if the price offered is reasonable.</p> <p><u>The Proposal</u></p> <p>It is proposed to implement a pilot scheme of 73 MW through Solar Energy Corporation of India (SECI). Roof space will be identified by SECI by contacting various organizations owning large warehouses. Each power plant would be of size ranging between 500 kW to 5.0</p>



		<p>MW. They will then aggregate total of 73 MW and go for tariff based bidding for supplying power for a period of 25 years. SECI will also contact to the DISCOMS in areas where these plants are coming up for purchase of power. The power will be produced by the contracting agencies on behalf of SECI who will be the developer. SECI will then sign PPA with concerned DISCOM to supply the power at a tariff of about ₹ 7 per kW hour at the nearest inter-connection point of the DISCOM (11 KV or 33 KV sub-station).</p> <p>The rooftop owner will be given a fixed rent of 50 paise per kW/hour of energy sold by SECI from power generated by them by utilizing rooftop space. A subsidy of ₹ 2 crore per MW would be given to SECI by MNRE in order to support this pilot scheme. This subsidy would be given in two instalments – 50 % as advance and 50% as and when the power plant is commissioned.</p> <p>If SECI is able to get a better tariff through tenders there will be some earning for SECI with this subsidy. It is expected that SECI will get tariff around ₹ 8.5 per kWh. The realization to SECI for sale of power would be ₹ 6.5 per kW/hour leaving a gap of around ₹ 2 per kW/hour. This is proposed to be made from the subsidy amount.</p> <p>The estimated cost of the project is ₹ 148.92 crore (ref. para 2.4).</p>
2.2	Justification for the project	<p>The power generated through solar energy will help in reduction of the use of commercial grid power in the warehouses and the extra power generated will be supplied to the grid and will also reduce the GHG emission. The Solar PV System on the rooftop of the selected warehouses will be installed for meeting upto 90% of the annual energy requirements depending upon the area of rooftop available and the remaining energy requirement of the office buildings will be met by drawing power from grid at commercial tariff of DISCOMS.</p> <p>This project would demonstrate the grid interactive/integrated renewable energy application. In this way the project would achieve the objective of the National Clean Energy Fund by reducing the GHGs emissions substantially.</p> <p>This is a very upcoming area and the successful demonstration of these projects will encourage others to follow the suit.</p>
2.3	Possible alternatives, if any	NA



2.4	Estimated Capital costs with break-up under major heads of expenditure. Also indicate the basis of cost estimation	<p>The average size of the plant would be in the range of 500 kWp to 5.0 MWp.</p> <p>The total cost of the project is estimated to be ₹ 148.92 crore for aggregate 73 MW projects as follows:</p> <table border="1" data-bbox="776 331 1503 951"> <thead> <tr> <th data-bbox="776 331 857 405">Sl. No.</th> <th data-bbox="857 331 1255 405">Item/Component</th> <th data-bbox="1255 331 1503 405">Estimated Cost</th> </tr> </thead> <tbody> <tr> <td data-bbox="776 405 857 583">(i)</td> <td data-bbox="857 405 1255 583">Estimated Central Financial Assistance (CFA) of total 73 MWp plants @ total 73 MWp plants @ ₹ 2.00 crore/MWp</td> <td data-bbox="1255 405 1503 583">₹ 146 crore</td> </tr> <tr> <td data-bbox="776 583 857 919">(ii)</td> <td data-bbox="857 583 1255 919">2% towards field visits, technical guidance, inspection IT enabled monitoring and evaluation publicity orientation, awareness programme, trainings site visits of stakeholders, inspection monitoring etc.</td> <td data-bbox="1255 583 1503 919">₹ 2.92 crore</td> </tr> <tr> <td colspan="2" data-bbox="776 919 1255 951">Total</td> <td data-bbox="1255 919 1503 951">₹148.92 crore</td> </tr> </tbody> </table>	Sl. No.	Item/Component	Estimated Cost	(i)	Estimated Central Financial Assistance (CFA) of total 73 MWp plants @ total 73 MWp plants @ ₹ 2.00 crore/MWp	₹ 146 crore	(ii)	2% towards field visits, technical guidance, inspection IT enabled monitoring and evaluation publicity orientation, awareness programme, trainings site visits of stakeholders, inspection monitoring etc.	₹ 2.92 crore	Total		₹148.92 crore
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Total		₹148.92 crore												
2.5	Phasing of investment	The entire project will be implemented within 18 months in the country												
2.6	Project Implementation Schedule (PIS)	Duration 18 months from the date of sanction.												
2.7	A status note on assets required (e.g. land/machinery) to initiate the project, along with firm time lines by which Necessary infrastructure shall be in place.	The rooftop will be already/always available with beneficiary. The major equipment include-SPV panels, inverters, meters, panel installation structures etc. which will be procured under respective project as per rules. Time frame will be 18 months for execution of the project from the date of sanctioning for each Project.												
2.8	Whether project is covered under any other scheme of GOI/State Government. If yes, why it is not being supported from that scheme?	This project is not covered in the regular scheme under JNNSM. This project will also help in formulating a new scheme.												
3.	Pilot/Demonstration Project													
3.1	Is the project in the nature of a Pilot/Demonstration Project?	Pilot Project												
3.2	If so, desired or targeted expansions.	It is targeted to be expanded in various buildings of warehouses all over the Country.												
4.	R&D Projects													
4.1	Sketch of the project background, with Critical evaluation of the existing situation, specifically identifying the gaps which the project is intended to fill. Confirm that the same project proposal has	NA												



	not been submitted, for funding, to any other organization, in India and abroad.	
4.2	A brief note on objectives intended to be accomplished and indicating importance of the project	The project aims to reduce the fossil fuel based electricity load on main grid and make the buildings self-sustainable to the extent possible. This will also pave the way for other entities/establishment to follow the suite.
4.3	Approach and procedure to be used to accomplish the specific objectives	To promote the net metering, the DISCOMs/Utilities and the respective beneficiaries will be associated to work together.
4.4	A milestone chart indicating the desired target deliverable.	The project will be completed in 18 months.
5.	Financing Arrangements	
5.1	Sources of financing (equity, debt mezzanine capital etc.)	About ₹ 2 crore per MW subsidy from National Clean Energy Fund and balance by the beneficiary/investment by developers/beneficiaries.
5.2	Indicate the revenue streams of the Project (annual flows over project life). Also indicate the underlying assumptions	It is expected that SECI will get tariff around ₹ 8.5 per kW hour. The realization to SECI for sale of power would be ₹ 6.5 per kW/hour leaving a gap of around ₹ 2 per kW/hour. This is proposed to be met from the subsidy amount.
5.3	Who will fix the tariff/ user charges (if applicable)? Please specify in detail	Respective DISCOM / Utility will fix tariff.
5.4	Have any FIs been approached? If yes, response may be indicated	No
6.	IRR	NA
6.1	Economic IRR (if computed)	NA
6.2	Financial IRR, indicating various assumptions (attach separate sheet if necessary)	NA
7.	Clearances	
7.1	Status of environmental clearances, if Required	Not required (Renewable Energy Programme)
7.2	Clearance required from the State Government and other local bodies	Not required (Renewable Energy Programme)



7.3	Other support required from the State Government	Not required (Renewable Energy Programme)
8.	Gol Support	
8.1	Viability Gap Funding/loan from GOI required	The expected financial support up to about ₹ 2 crore per MW of the project cost is proposed to be provided through the Ministry of New and Renewable Energy out of the NCEF funding as direct subsidy. This will bring down the cost of solar electricity in the range of about ₹ 6.5/kWh. The balance cost will be met by respective building owner/beneficiary of the warehouses.
8.2	Basis of quantum of VGF arrived at	NA
9.	Pollution Control/Energy Savings (If project is not related to renewable energy)	Not required
9.1	A note on possible impact of successful implementation of the project on pollution control/climate change/better utilization of clean energy resources	The clean solar energy will be utilized for electricity generation hence, it will mitigate greenhouse gases emission in the
9.2	Whether a study has been conducted to support the above? If yes, copy may be attached.	
10.	Outcomes	
10.1	Observable parameters arising out of successful implementation of the project along with time lines	<i>The number of units (kWh) of electricity generated out of aggregate 73 MW projects:</i> Assuming the average annual generation of 1.8 million units of electricity/MWp, the estimated green electricity of 131.4 million units will be generated annually. This will save about 131.4 million tons of CO ₂ emissions every year hence, will substantially contribute in improving the environment.
11	Timeframe	
11.1	Duration of the Project	18 months
11.2	Timeframe of the proposed implementation vis-à-vis various milestones.	The entire project will be implemented in 18 months including identification, agreements, procurement, installation and commissioning etc.
12	IPR Issues	
12.1	Whether any Intellectual Property	NA



	Right(s) are to be created?	
12.2	If yes, then details thereof. An undertaking must be attached by Project authorities to allow GOI unrestricted legal claim to the IPR created in the project	NA
13	Summary	
13.1	Problem Statement (1-2 paragraphs)	<p>Ministry of Power through CEA has recently notified the CEA (Technical Standards for Connectivity of the Distributed Generation Resources) Regulations, 2013 on grid connectivity and metering mechanism for such small scale decentralized renewable energy based electricity generating project. This will permit/encourage the DISCOMs to allow the grid connectivity of the solar rooftop projects.</p> <p>This NCEF funded project will help in demonstrating the technology, functioning of grid connectivity and metering mechanism. It will also demonstrate various business models for sustained functioning of the projects.</p>
13.2	Proposed Transformation (1-2 paragraphs)	<p>The project is expected to demonstrate the functioning of rooftop SPV grid interactive projects which will motivate the private users/common man to adopt in there available rooftop. This will bring a change in the approach and will create a big market of rooftop SPV application in the country.</p> <p>This will also encourage the private participation to invest in contributing the mitigation of the GHGs emissions.</p>
13.3	Implementation Readiness (1-2 paragraphs)	<p>All Implementing agencies are equipped with experts and are ready to implement the project through open bid basis/benchmark cost as decided by MNRE and also to provide capacity building for the concerned stakeholders.</p> <p>The MNRE has been able to propagate the utilization of solar energy for electricity generation over the last two decades. The technology of solar panels, invertors, balance of system is market ready at this stage.</p> <p>However, there integration with grid connectivity for small scale applications needs to be established to raise the confidence of the users and the Distribution Licensees. This project will help in this direction.</p>
13.4	Rationale for NCEF Financing (1-2 paragraphs)	Since, at present there is no exclusive regular scheme in the Ministry to support grid connected rooftop SPV power projects, the mechanism for installation, operation



		and maintenance of grid connected projects is yet to be established. The financial assistance of ₹ 2 crore per MW from NCEF will enable these projects to be financially viable. This will also establish the mechanism for feeding solar power to the grid and its trade thereof. This will also establish the technology of appropriate grid connectivity, metering mechanism, invertors etc. through field performance of these project and thus will help in making the technology available for the people.
13.5	Financing Plan	<p>About ₹ 148.92 crore central financial assistance on capital cost is expected to be provided under the national clean energy fund.</p> <p>(i) An agreement between the implementing agency, beneficiary and the DISCOM will be entered into for supply of power by the channel partner to the user on agreed tariff for about next 15-20 years.</p> <p>(ii) The balance cost will be provided by the respective beneficiary. The RESCO model will also be tried in which the selected RESCO will invest balance project cost and will recover from user on agreed terms/tariff.</p>
13.6	Project Preparation Timetable	The entire project will be implemented in 18 months including identification, agreements, procurement, installation and commissioning etc.
14	Others	
14.1	Remarks, if any	The pilot scheme for Grid Connected Rooftop Solar Power Generation in the rooftops of warehousing corporations godowns is enclosed



**Government of India
Ministry of New and Renewable Energy**

Pilot Scheme for Grid Connected Rooftop Solar Power Generation

Background

While India has huge potential for generating solar power, India also has large number of buildings where space on the roof is lying unutilized. Several of these buildings are using diesel for generating power to meet part of their requirement. The cost of generating power using solar power has come down considerably in the last one year and we have offers of as low as ₹ 7.49 per kw/hour for a 5.0 MW project in the first phase of JNNSM. In countries like Germany and US where solar power generation capacities have increased considerably in the last couple of years, it has been observed that a major part of this capacity is coming in the form of rooftop solar projects which are grid connected. In most cases, the power is primarily for self-consumption and only surplus power is fed into the grid whereas in certain countries where high feed in tariff has been declared, all the power generated through rooftop is being fed into the grid. In India, this system has somehow not taken off in a big way primarily because the owners of rooftops have not realized how beneficial this could be in a country where acute power shortages are common. It is, therefore, proposed to do a pilot project in order to demonstrate and create awareness and build volume so that costs can also come down in rooftop solar generation.

2.0 Grid Connected Rooftop SPV System – Concept

In grid interactive 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 system installed at institution/commercial establishment or residential complex. They generate power during the day time which is utilized fully by powering captive loads and feeding 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.

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'.

In short these are SPV systems installed on rooftops of residential, commercial or industrial premises connected to the local grid where the Electricity generated could be fed into the grid at regulated feed-in tariffs or used for self-consumption with net-metering approach.

3.0 Advantages

The advantages of Rooftop System includes Savings in transmission and distribution losses, low gestation period for installation, no requirement of additional land, improvement of tail-end grid voltages and reduction in system congestion with higher self-consumption of solar



electricity. It generates the local employment and the network losses can be avoided as each kWh of SPV electricity generated can save 1.25 kWh electricity generated at source by conventional fuels.

Large size buildings can generate some power using the shareable space on their rooftops and consume that power themselves. If there is spare power they can put that power into the grid. The solar power plant installed on their rooftop would help in reducing dependence on diesel generated power at least during the day time in areas where grid power is not reliable. In places where grid power is reliable, the requirement of grid power would reduce. The building owner would get clean power at a fixed rate over the next 20 years. The rate of grid power is going up every year and, therefore, if calculated over a period of 20 years, solar power may turn out to be cheaper than the grid power. While we understand that it is very much beneficial for every building owner or occupant to install solar power plant on their rooftop, most of the building owners do not realize this and, therefore, there is a need for this pilot project. Besides demonstration, the pilot project would help bring volumes in few selected pockets thereby reducing the cost, bringing in good companies and setting up arrangements for maintenance. Thereafter this can take off in a big way and with expected future cost reductions it may become attractive even without any subsidy or Government support.

4.0 Target areas and buildings

The projects will target large number of warehouses owned by various organizations like Warehousing Corporation of India, Food Corporation of India, State Government organizations and some private companies which have huge vacant roof space and vacant land in / around their warehouses. Unlike industry and commercial organizations they do not require much power for their own needs. Most of these warehouses are in States like Punjab, Haryana where cost of land is very high and, therefore, this rooftop space can be very well utilized.

5.0 Plant size

It is proposed to set up Grid Connected Rooftop SPV power plants between from 500 kWp upto 5.0 MWp. These plants would be without battery. They would generate power and this power would be directly brought into the electricity distribution network in the building with proper system design so that surplus power can flow into the grid wherever possible. If the building already has some battery installed that may also be integrated into the system. If there is a diesel generator or other backup already available, it may continue as such and integrated into the system. A system of metering would be devised so that energy flowing into the grid and flowing from the grid is well accounted for. As subsidy is proposed to be given, therefore, full feed in tariff declared for solar power would not be payable for energy put into the grid. Regulators may declare separate feed in tariff for energy which is generated from power systems which have got Government subsidy. This may come very close to the rate at which power is supplied from the grid and, therefore, the accounting problems would be minimized.

6.0 Implementation agency

Solar Energy Corporation of India (SECI) will be the implementing agency which will work in collaboration with Warehousing Corporation of India, Food Corporation of India, State Government organizations and some private companies having huge vacant roof space and vacant land in / around their warehouses.



7.0 Initiatives taken by States on Grid Connected Rooftop SPV Plants

Few States i.e. Andhra Pradesh, West Bengal, Gujarat, Karnataka, Tamil Nadu, Chhattisgarh, Chandigarh, Kerala, Uttarakhand, Punjab etc. have taken initiatives in promoting grid connected rooftop SPV systems through suitable policy measures and incentives.

8.0 Implementing Strategy

Roof space will be identified by SECI by contacting various organizations owning large warehouses. Each power plant would be of size ranging between 500 kW to 5.0 MW. They will then aggregate total of 73 MW and go for tariff based bidding for supplying power for a period of 25 years. SECI will also contact to the DISCOMS in areas where these plants are coming up for purchase of power. The power will be produced by the contracting agencies on behalf of SECI who will be the developer. SECI will then sign PPA with concerned DISCOM to supply the power at a tariff of about ₹ 7 per kW hour at the nearest inter-connection point of the DISCOM (11 KV or 33 KV sub-station).

The rooftop owner will be given a fixed rent of 50 paise per kW/hour of energy sold by SECI from power generated by them by utilizing rooftop space. A subsidy of ₹ 2 crore per MW would be given to SECI by MNRE in order to support this pilot scheme. This subsidy would be given in two instalments – 50 % as advance and 50% as and when the power plant is commissioned.

If SECI is able to get a better tariff through tenders there will be some earning for SECI with this subsidy. It is expected that SECI will get tariff around ₹ 8.5 per kWh. The realization to SECI for sale of power would be ₹ 6.5 per kW/hour leaving a gap of around ₹ 2 per kW/hour. This is proposed to be met from the subsidy amount.

The pilot project would start with awareness programme. This would be done through advertisements and awareness campaigns in the few selected potential states. The targets will be allocated to the beneficiary organizations depending upon their requirements and capabilities. One or more consultants (companies who have experience in this field) may be hired for this job. They will be asked to organize half-day or one-day workshops, make presentations and organize meetings with stakeholders, depute a team of experts for one to one interaction and use such other means as may be considered useful. Approximately two-three months' time would be spent in this. Thereafter, an advertisement would be issued to collect the demand of power plants from various buildings. The advertisement would indicate that Government would provide a subsidy of ₹ 2 crore per MW on the cost of system and SNAs would also provide technical assistance as well as guidance. Based on the demand generated some pockets would be identified for implementation of pilot project.

Any other business model will also be accepted with due discussion with the SNAs. The suggestive guidelines proposed for implementation are given in Annexure enclosed. However, site specific modifications may be carried out while implementing the project by the MNRE/ SNAs.

9.0 Monitoring evaluation and technical help

SECI will be required to submit quarterly progress report. MNRE would monitor the projects during implementation as well as after implementation for at least two years. It would collect generation data and prepare reports to give feedback about the success of the programme. It would also continue to provide technical help and guidance to the project developers during setting up and running of the power projects. The online system for monitoring and evaluation will be developed and the efforts will be made to collect the real time generation data of each project.



ANNEXURE

Suggestive Guidelines for

Installation of Grid Connected Rooftop Solar Photovoltaic Power Plants with aggregate 73 MWp capacity by SECI on Pilot Basis under NCEF

- The project includes Installation of Grid Connected Rooftop Solar Photovoltaic Power Plants with aggregate 73 MWp capacity in various large number of warehouses owned by various organizations like Warehousing Corporation of India, Food Corporation of India, State Government organizations and some private companies which have huge vacant roof space and vacant land in / around their warehouses across the Country on Pilot Basis. The project aims to reduce the fossil fuel based electricity load on main grid and make the buildings self-sustainable to the extent possible.
- Projects can be set up on the concept of Net Metering/ Feed-in-Tariff on Pilot Basis. The individual project will normally range from 500 kW to 5.0 MW size.
- The project envisages installation of Grid connected Rooftop Solar Photovoltaic Power Plants on the roofs of Government /Commercial/ Institutional/Industrial buildings of the godowns/warehouses located in various States across the country.
- The project will be implemented by Solar Energy Corporation of India.
- The generated solar power will be utilized for captive application and the surplus power will be fed to the grid.
- The total cost of the project is estimated to be ₹ 148.92 crore for aggregate 73 MW including 2% for the publicity, orientation, awareness programme, trainings site visits of stakeholders projects, service charges, field visits, technical guidance, monitoring and evaluation for SNAs.
- The Solar PV System on the rooftop of the selected Buildings will be installed for meeting upto 90% of the annual energy requirements depending upon the area of rooftop available and the remaining energy requirement of the office buildings will be met by drawing power from grid at commercial tariff of DISCOMs.
- This project would demonstrate the grid interactive/ integrated renewable energy application. In this way the project would achieve the objective of the National Clean Energy Fund by reducing the GHGs emissions substantially.
- The ministry has earmarked the present benchmark cost of ₹ 90/- per Wp for Grid Connected Rooftop SPV Power Plants of Above 100kWp capacity. The benchmark cost may be revised time to time. However, the SECI will implement the projects on open tender basis.
- Time frame will be 18 months for execution of the project from the date of sanctioning for each Project.
- The rooftop will be owned by the beneficiary; however, the roof renting model may also be adopted. The major equipment include-SPV panels, inverters, meters, panel installation structures etc. which will be procured under respective project as per rules.



- About ₹ 2 crore per MW for each project can be provided from National Clean Energy Fund and balance will need to be met by the beneficiary/investment by developers/ state govt. or any other source.
- Energy Generated above the requirement may be fed to grid at commercial tariff @ about average of ₹ 6.00 per unit. However the actual tariff will vary from state to state and may be decided by DISCOMs/Regulators/developers.
- This NCEF funded project will help in demonstrating the technology, functioning of grid connectivity and metering mechanism. It will also demonstrate various business models for sustained functioning of the projects which will motivate the private users/common man to adopt in their available rooftop. This will also help the States to formulate/ modify their Grid Connected Rooftop SPV plants policy.
- An agreement between the implementing agency, beneficiary and the DISCOM may be entered into for supply of power by the developer to the user on agreed tariff for about next 15-20 years.
- The balance cost will be provided by the respective beneficiary. The RESCO model will also be tried in which the selected RESCO will invest balance project cost and will recover from user on agreed terms/tariff.
- SECI will submit the quarterly progress report to MNRE indicating the physical and financial progress made. The report will contain the site details, contact person/beneficiary/correspondence address. The site should be available for the inspection/verification purpose by the MNRE of third party inspection.
- Regarding the technical standards of the SPV panels, inverters, meters and other balance of systems, the guidelines of MNRE issued under relevant schemes, time to time will be followed.
- In case of any dispute, the decision of the MNRE will be final.

