

**No. 5/23/2009-P&C**  
 Government of India  
 Ministry of New & Renewable Energy  
 (Solar Group)

Block NO. 14, CGO Complex,  
 Lodi Road, New Delhi-110 003  
**Dated: 8<sup>th</sup> July, 2010**

To

The Pay & Accounts Officer  
 Ministry of New and Renewable Energy  
 New Delhi.

**Subject: Implementation of the programme on “Off-grid and Decentralized Solar Applications” for first phase of the Jawaharlal Nehru National Solar Mission (JNNSM) till 31<sup>st</sup> March, 2013, during 2010-11.**

Sir,

I am directed to refer to the Resolution No.5/14/2008-P&C dated 11<sup>th</sup> January, 2010 conveying the approval of Government for implementation of the first phase of the Jawaharlal Nehru National Solar Mission during 2009-2013 and fixing the target for setting up 1,000 MW grid connected (33 KV and above) solar plants, 100 MW of roof top and small solar plants connected to LT/11 KV grid, 200 MW capacity equivalent off-grid solar applications and 7 million sq. meters of solar thermal collector area during the first phase till March, 2013 with an outlay of Rs.4337 crore. In accordance with para 12 of the aforesaid Resolution, this Ministry has issued the detailed guidelines for implementation of one of the components on “Off-grid and Decentralized Solar Applications” vide F.No.5/23/2009-P&C dated 16.6.2010 a copy of which is enclosed. The guidelines have also been uploaded on the Ministry’s website [www.mnre.gov.in](http://www.mnre.gov.in).

2. I am directed to convey the sanction of President for the implementation of the aforesaid guidelines on “Off-grid and Decentralized Solar Applications” during 2010-11 towards meeting the targets set for the first phase of the Jawaharlal Nehru National Solar Mission (JNNSM), and the funds for its implementation would be met from the following budget provisions made in the current year’s Budget 2010-11 (Plan):-

<b>Budget Heads</b>	<b>Budget Provisions</b>
Demand No.67-Ministry of New & Renewable Energy; Major Head:2810-New & Renewable Energy; 101-Grid Interactive & Distributed Renewable Power, 02-Off-grid/Distributed & Decentralized Renewable Power, 04-Solar Power, <b>31-Grants-in-aid General</b> 02.04.28-Professional Charges,	Rs.224.00 crore Rs.3.00 crore

DemandNo.67; Major Head:2810-New & Renewable Energy; 103-Renewable Energy for Urban, Industrial & Commercial Applications, 01-ST, <b>SPV &amp; other RE Systems</b> , 01-Renewable Energy Application, <b>33-Subsidy</b>	Rs.10.00 crore
DemandNo.67; Major Head:2810-New & Renewable Energy; 103-Renewable Energy for Urban, Industrial & Commercial Applications, 02-Solar Thermal Systems – <b>Solar Water Heating</b> , 01-Renewable Energy Application, <b>33-Subsidy</b>	Rs.15.00 crore

3. This sanction will supersede the following Administrative Approvals issued earlier for implementation of the Schemes/programmes, mentioned against each, but with the exceptions given under the following table:-

S. No.	Sanction No. Date	Scheme/Programme
1	No.3/1/2007/UICA(SE) dated 18.08.2008	Programme on “Accelerated development and deployment of Solar Water Heating Systems in Domestic, industrial and commercial sectors”.
2	No3/2/2005-UICA(SE) dated 26 <sup>th</sup> July 2005,	“Promotion of Solar Thermal Systems for air heating/Steam generating applications, Solar buildings and Akshay Urja Shops”.
3	No.32/76/2009-10/PVSE dated 17 <sup>th</sup> August, 2009	Demonstration Programme on providing “Incentives to Banks/ Micro Financing Institutions to support installation of Solar Home Lighting & other small Solar Systems through loans in the country”.
4	No 32/01/2009-10/PVSE, dated 10 <sup>th</sup> July, 2009 and 27 <sup>th</sup> April, 2010	Implementation of Solar Photovoltaic (SPV) Programme.
5	No.11/1/2006-ST dated 26.10.2006	Solar Thermal Energy Demonstration Programme.
6	No 32/37/2006-07/PVSE dated 10.10.2006	Implementation of the ‘Solar Lantern Programme’ during 2006-07 and for subsequent years.
7.	No. 21/1/2005-06/ PVSE dated 27.09.2005	Implementation of the Scheme “SPV water Pumping Programme during 2005-06” and for subsequent years.

Exception 1: The Solar Building component of the scheme mentioned against S.No.2 above will not supersede as the solar building component of this scheme has been modified and a separate scheme on “Energy Efficient Solar/Green Buildings’ issued vide Administrative Approval No. 3/5/2008-UICA(SE) dated 5.2.2009 and 28.7.2009 is still under implementation.

Exception 2: The component relating to ‘Akshay Urja Shops’ of the scheme mentioned against S.No.2 above will also not supersede.

4. Since the above guidelines on "Off-grid and Decentralized Solar Applications" were released by the Minister, NRE on 16<sup>th</sup> June 2010, the implementation of the programme also come into effect from 16.6.2010.

5. This sanction issues in exercise of powers delegated to this Ministry and with the concurrence of IFD dated 05.07.2010 vide their Dy.No.IFD/607/2010-11 dated 6<sup>th</sup> July 2010.

Yours faithfully,

**(Prem Chand)**

Under Secretary to Government of India  
Phone: 011-24360707, Extn. 1023

Copy for information and necessary action to:-

1. All Central Government 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-110 002
4. All State/UT Energy Secretaries
5. All Heads of State/UT Nodal Agencies
6. All State/UT Utilities
7. All Municipal Commissioners
8. CMD, IREDA, August Kranti Bhawan, Bhikaiji Cama Place, New Delhi
9. Director General, Bureau of Indian Standards, Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi-110002.
10. All the Nationalized and Scheduled Banks

Internal Distribution:

1. PS to Hon'ble Minister, NRE & PSO to Secretary, MNRE, PS to AS&FA, MNRE
2. All Advisers & Group Heads/ JS(G)/JS(HK)
3. Adviser & Head, Solar Energy Centre, Gwal Pahari, Gurgaon
4. All Directors, PSO (GP), PSO (SKS), PSO (AN)
5. All Under Secretaries in MNRE
6. Dir. (NIC) to upload this on the Ministry's website.
7. CA, MNRE / Cash Section
8. Hindi Section for Hindi version
9. Sanction folder

**(Prem Chand)**

Under Secretary to Government of India

No.5/23/2009-P&amp;C

Dated 16.06.2010

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

**GUIDELINES FOR OFF-GRID AND DECENTRALISED SOLAR APPLICATION**

**1. Background:**

The Government has recently launched the Jawaharlal Nehru National Solar Mission, 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 March 2013) will, inter alia, focus on promoting off-grid systems including hybrid systems to meet / supplement power, heating and cooling energy requirements. 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.

In order to create a sustained interest within the investor community, it is proposed to support viable business models. Flexibility is an integral feature of this scheme. The scheme is completely demand driven as it offers a bouquet of incentive instruments from which eligible entities can tailor a package appropriate to their needs and circumstances within the boundary conditions of the scheme.

**2. Objectives:**

- 2.1 To promote off-grid applications of solar energy (both SPV and Solar Thermal) for meeting the targets set in the Jawaharlal Nehru National Solar Mission for Phase-I.
- 2.2 To create awareness and demonstrate effective and innovative use of Solar systems for individual/ community/ institutional/ industrial applications.
- 2.3 To encourage innovation in addressing market needs and promoting sustainable business models.
- 2.4 To provide support to channel partners and potential beneficiaries, within the framework of boundary conditions and in a flexible demand driven mode.
- 2.5 To create a paradigm shift needed for commoditization of off-grid decentralized solar applications.

**No.5/23/2009-P&C**

**Dated 16.06.2010**

2.6 To support consultancy services, seminars, symposia, capacity building, awareness campaigns, human resource development, etc.

2.7 To encourage replacement of kerosene& diesel, wherever possible.

**3. Scope of the Scheme:**

3.1 The scheme would be applicable to all parts of India and would, to begin with, be co-terminus with Phase-I of the Jawaharlal Nehru National Solar Mission and will, inter alia, focus on promoting off-grid and decentralized systems, including hybrid systems to meet/ supplement lighting, electricity/power, heating and cooling energy requirements. In respect of hybrid systems for which there is a specific scheme (eg. wind solar), provisions thereof would apply. However, in respect of hybrids for which there is no specific scheme (i.e. with other renewable energy components), the scheme for the respective off grid renewable source, would be the basis for calculating the subsidy. Initially, only solar wind-solar hybrid and solar bioenergy hybrids would get considered under the scheme but the Project Appraisal Committee could also examine other feasible hybrid technologies for inclusion in the scheme.

3.2 Various off-grid solar photo voltaic systems / applications up to a maximum capacity of 100 kWp per site and off-grid and decentralized solar thermal applications, to meet / supplement lighting, electricity/power, heating and cooling energy requirements would be eligible for being covered under the Scheme. For mini-grids for rural electrification, applications up to a maximum capacity of 250 kW per site, would be supported.

3.3 Soft loans for projects, including a component for working capital, will be available to SME manufacturers of solar thermal systems and Balance of systems manufacturers for Solar PV (excluding battery manufacturers), in order to promote technology up-gradation, improvement in technology, expansion in production facilities, etc. through refinance facility implemented through IREDA.

3.4 Boundary conditions for the scheme are at **Annexure IA and IB**.

3.5 A provision of 3% of the annual budgeted outlay for scheme, shall be made for administrative expenditure, evaluation and other studies, seminars, information dissemination, IEC activities, capacity building and support for putting in IT enabled monitoring mechanisms, etc. An incentive scheme for banks has been detailed out in **Annexure 2**.

No.5/23/2009-P&amp;C

Dated 16.06.2010

**4. Implementation Arrangements:**

4.1 The Scheme would be implemented through multiple channel partners for rapid up-scaling in an inclusive mode. It is envisaged that these channel partners would enable significant reduction in transaction cost and time, since without these arrangements, individuals and small groups of clients may not be in a position to access the provisions of the scheme. Channel partners which would be used for implementation could include the following:-

- a) Renewable Energy Service Providing Companies (RESCOs)
- b) Financial Institutions including microfinance institutions acting as Aggregators
- c) Financial Integrators
- d) System Integrators
- e) Programme Administrators

4.2 The details of the channel partners are as under:

**a) Renewable Energy Service Providing Companies (RESCOs):**

These are companies which would install, own & operate RE systems and provide energy services to consumers. These entities may tie up with FIs for accessing the financial support under the scheme.

**b) FIs including MFIs acting as Aggregators:**

These would be institutions which are involved in consumer finance and have established base of customers in rural/urban areas and outreach through self help groups, etc. These would typically access interest subsidy through refinance facility as also credit linked capital subsidy on behalf of their borrowers from IREDA.

**c) Financial Integrators:**

These are entities which would integrate different sources of finance including carbon finance, government assistance and other sources of funds to design financial products/ instruments and make these available to their clients at an affordable cost. These entities would tie up with manufacturers and service providers.

**d) System Integrators:**

These are companies/ entities which would provide RE systems & services to clients including design, supply, integration and installation, O&M and other services. These entities may tie up with FIs for accessing the financial support under the scheme.

**No.5/23/2009-P&C**

**Dated 16.06.2010**

**e) Programme Administrators:**

These would include, inter alia, Central and State Government Ministries and Departments and their organizations, State Nodal Agencies, Utilities, Local bodies, PSUs and reputed Non-Governmental Organizations (NGOs). These entities would directly implement the scheme and access capital subsidy (non credit linked) from MNRE.

4.3 The various channel partners who can participate in this Scheme have been described above and a transparent methodology for accrediting these entities by MNRE would be put in place. The parameters for accrediting an entity could comprise of:

- a) Net worth / turnover of the participating entity
- b) Technical capability for carrying out services which would, inter alia, include site selection, feasibility study, design, value engineering, cost optimization, time scheduling, procurement, installation/commissioning and O&M functions
- c) Credit rating, if any
- d) Track record
- e) Tie-ups with equipment providers.

4.4 The accreditation process would categorize the various entities into grades which would determine the quantum of work in terms of financial limits that they could undertake under the Scheme. This accreditation process would also enable inclusion of start ups with the requisite technical and installation skills. There would be a provision for up gradation and down gradation commensurate with their performance in implementing projects under this Scheme. Reputed rating agencies would be involved by the Ministry.

4.5 An opportunity would be provided for young entrepreneurs to participate as channel partners in order to tap their creative potential as innovators. Separate templates on eligibility of different channel partners would be evolved.

**5. Funding Pattern.**

5.1 Funding under the scheme would be in Project mode, i.e. there must be a project report which would, inter alia, include client details, technical & financial details, O&M and monitoring arrangements. The total project cost shall be funded through a mix of debt and incentives where the promoters' equity contribution would be at least 20% (unless otherwise specified). Techno-economic specifications for a minimum cut-off level for the requirement of the project mode would be specified by MNRE.

5.2 MNRE would provide financial support through a combination of 30 % subsidy and/or 5% interest bearing loans. The bench mark project cost for 2010-11 have been

**No.5/23/2009-P&C**

**Dated 16.06.2010**

worked out for these systems and the CFA of 30% thereof has been defined in the boundary conditions detailed in **Annexure 1A and 1 B**.

5.3 For the year 2010-11, the benchmark price for photovoltaic systems with battery back-up support is considered as Rs.300/- per Wp. In case of the systems, which do not use storage battery such as water pumping systems, the installed PV system cost is considered as a maximum of Rs.210 per Wp.

5.4 Capital subsidy of 90% of the benchmark cost, would be available for special category states, viz. NE, Sikkim, J&K, Himachal Pradesh and Uttarakhand. In addition, it would be extended for setting up only stand alone rural solar power plants / packs (both PV and thermal projects) in remote and difficult areas such as Lakshadweep, Andaman & Nicobar Islands, and districts on India's international borders. However, for funding solar thermal systems in these areas, the subsidy would be limited to 60% for all categories of beneficiaries. The subsidy pattern detailed above can be accessed by only Central and State Government Ministries, Departments and their organizations, State Nodal Agencies and Local bodies.

5.5 There would be a provision for channel partners, operating in the market mode to access a combination of capital subsidy and a low cost interest for the end consumer, provided they can tie up with a lending institution. These lending institutions could then enter into an agreement for refinance/ interest subvention with IREDA. MNRE would provide IREDA fund handling charges at the rate of 2% for the capital subsidy/interest subvention portion.

5.6 Funds received by IREDA from MNRE without cost may be made available by it for PAC approved projects directly at interest rate not exceeding 5% p.a as also by way of refinance to the primary lending institutions at a rate of interest not exceeding 2% p.a, subject to the condition that the rate of interest charged by the lending institution to the borrower in respect of the loan does not exceed 5% p.a.

5.7 The Interest Subsidy under the Scheme would be made available to Non-Banking Financial Companies (NBFCs) and Scheduled Commercial Banks (excluding Regional Rural Banks) by way of refinance from IREDA.

5.8 IREDA would also make available funds received from MNRE under this Scheme, to NABARD, NHB, SIDBI and any other institution as may be specified by the MNRE in this behalf, for providing refinance on the same terms, to Regional Rural Banks, Housing Finance Companies, or any other primary lending institutions included by them, in their respective refinance schemes. MNRE would provide a service charge of 0.5% to IREDA for this.

5.9 MNRE would also fund IREDA for meeting the expenditure towards development of software and hardware, based on an estimate provided by IREDA, for implementing

**No.5/23/2009-P&C**

**Dated 16.06.2010**

and monitoring the scheme effectively. IREDA would present an audited annual statement of accounts.

5.10 3% of CFA would be admissible as service charges to programme administrators. For projects which involve civil society organizations and are aimed at the poor strata of society, eg. projects for deploying solar lanterns / home-lighting systems with small wattage and solar cookers etc, upto 10% of the CFA would be admissible as institutional charges. These would be provided by MNRE, in addition to the CFA.

5.11 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. This is to avoid multiple financing.

## **6. Bouquet of Incentive Instruments:**

6.1 In the interest of sustaining of satisfactory performance and generation of output in the envisaged energy forms a flexible funding approach can be considered from the following bouquet of instruments:

### **a) RE Voucher/Stamp**

A Transaction-cost free redeemable financial instrument, denominated in physical or monetary units. Placed in the hands of ultimate beneficiary it empowers him by giving him enhanced degree of freedom to choose. Hence, it can be used as an effective instrument to gauge and enhance consumer satisfaction at the retail level.

### **b) Capital Subsidy (Credit Linked and non credit linked)**

An instrument which lightens the burden of financing the initial project cost to enable financial closure of viable business proposition.

### **c) Interest Subsidy**

An instrument aimed at neutralizing the high cost of capital given after due diligence of credit appraisal by FIs, NBFC, Micro finance institutions.

### **d) Viability Gap Funding**

Financial support provided mostly in the form of initial grant in one or more installments to finance the project cost so as to create a viable business model. PPP Scheme of Ministry of Finance has this arrangement for physical infrastructure projects. It is supplemented by similar arrangement at the state level.

**No.5/23/2009-P&C****Dated 16.06.2010****e) Green Energy Bonds**

A form of low interest bearing long-term redeemable security, which could be issued by IREDA/ MNRE for Renewable Energy Projects. Analogy: Infrastructure Bond/Gold Bonds.

6.2 These would adhere to the boundary conditions specified and would be available individually or in combination, (to the borrowers, in case of credit-linked subsidy) through all channel partners, in addition to any fiscal benefits available to the sector.

**7. Release of Funds:**

7.1 The release of funds for the project shall be back ended as reimbursement on completion and verification thereof. However, for programme administrators, the release of funds could be front ended, with installments of 70% on sanction and 30% on completion. However, this could be extended to other entities on provision of appropriate sureties.

7.2 In respect of credit linked capital subsidy and interest subsidy the scheme would be implemented through IREDA, which will be the designated Nodal agency for disbursement of funds.

7.3 MNRE would place 50% of the estimated annual requirement of funds with IREDA upfront at the beginning of the year. The balance 50% would be released as second and final tranche of the annual requirement to IREDA after receipt of Utilisation Certificate, of not less than 50% of the first tranche released to IREDA. While releasing the second tranche, MNRE would take into consideration, revision in initial annual estimate (if any) for appropriate funding. IREDA would present an audited annual statement of accounts.

**8. Approval Mechanism**

The Committee constituted by MNRE, would approve the project within 45 days of receiving the project. Deficiency, if any, would be communicated in writing to the proposer/channel partner within 30 days and the Committee would then, on receipt of clear proposal approve the proposal. The project proposals shall be considered and sanctioned by a Project Approval Committee (PAC). This committee would provide approval as also review progress. The entire process of receiving proposals, processing them and giving approvals would be IT enabled. The committee would also frame rules and prescribe formats etc, for project approval, within the overall framework of this scheme, so as to make the process transparent.

**9. Project Management Consultant (PMC)**

The government would engage a reputed agency as a Project Management

**No.5/23/2009-P&C**

**Dated 16.06.2010**

Consultant (PMC). This agency would handle all the processes such as assistance for formulation, appraisal and screening of proposals preceding the formal approval which would be a sovereign function of MNRE. It would also assist the Ministry in formulating the detailed implementation guidelines/ formats, if any

## **10. Monitoring and Evaluation:**

10.1 Information and Communication Technology must form the backbone of monitoring system. Since the scheme envisages IT enabled monitoring and verification protocols, 5% of the total project cost would be available to the various channels partners for compliance. It is proposed that the monitoring is done as under:

- 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 as one time MIS for all credit linked cases.
- ii) As an additional level of monitoring, reputed Civil Society Groups, eminent persons, corporate houses (as an activity under Corporate Social Responsibility), SNAs and MNRE officials would be involved, for ground truthing on random sample basis.
- iii) For projects with applications above 10 kW, the system providers, would also make available generation data to MNRE at intervals specified.

10.2 It is envisaged that certified energy auditors , scheme monitors and others would be empanelled for certifying whether the outputs of the system correspond to the parameters laid down in the in-principle approval for non credit linked projects.

## **11. Technical Requirements**

11.1 The scheme would require the project proponents to strictly adhere to the national/international standards specified by the Ministry from time to time.

11.2 The Use of imported complete PV systems will not be permitted under the scheme. However, use of imported components of a complete PV system would be permitted, subject to adequate disclosure and compliance to specified quality norms and standards.

11.3 The minimal technical requirements and Quality Standards in respect of the off-grid SPV power plants/ systems are given in **Annexure-3**. These will come into effect w.e.f. 1st September 2010 to allow sufficient time to the SPV industry to gear up for the same. Existing guidelines w.r.t. technical requirements/ Quality Standards under the Ministry's SPV programmes will be valid during the interim period.

**No.5/23/2009-P&C****Dated 16.06.2010**

11.4 The existing National Standards/ MNRE Specifications in respect of Solar Thermal Components/ Systems are given in **Annexure-4**.

## **12. Supporting Innovation**

The Ministry could provide 100% CFA for undertaking pilot and demonstration projects through manufacturers and other organizations for demonstrating new and innovative applications of solar systems.

## **13. 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.

## **14. Review**

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

No.5/23/2009-P&amp;C

Dated 16.06.2010

**ANNEXURE -1A****BOUNDARY CONDITIONS FOR SUPPORT TO OFF-GRID SOLAR PV APPLICATIONS**

<b>1.</b>	<b>Individuals</b>		
A.	All applications except 1B	1 kWp	Capital Subsidy & Interest Subsidy
B.	Pumps for irrigation and community drinking water	5 kWp	
<b>2.</b>	<b>Non- Commercial entities</b>		
A.	All applications except 2B	100 kWp per site	Capital Subsidy & Interest Subsidy
B.	Mini-grids for rural electrification	250 kWp per site	
<b>3.</b>	<b>Industrial/Commercial entities</b>		
A.	All applications except 3B	100 kWp per site	Capital Subsidy Or Interest Subsidy
B.	Min-grid for rural electrification	250 kWp per site	

<b>Scale of Capital Subsidy:</b>		
Based on benchmarking annually.	Rs. 90/Wp	With battery storage
	Rs. 70/Wp	Without battery storage
<b>Scale of Interest Subsidy:</b>		
	Soft loan @ 5% p.a.	On the amount of project cost
		Less promoter's contribution
		Less capital subsidy amount

Use of the best/competitive and innovative technologies available globally would be allowed, subject to standards and technical parameters, laid down by MNRE.

To meet unmet community demand for electricity or in unelectrified rural areas, standalone rural SPV power plants with battery storage in a micro grid mode/ local distribution network, would be provided Rs.150/Wp of capital subsidy AND soft loan at 5%.

No.5/23/2009-P&amp;C

Dated 16.06.2010

**ANNEXURE –1B****BOUNDARY CONDITIONS FOR SUPPORT TO OFF-GRID SOLAR THERMAL APPLICATION**

<b>S. No.</b>	<b>Solar Collector type</b>	<b>Capital subsidy/ Collector area (Rs./ sq.m.)</b>
1	Evacuated Tube Collectors (ETCs)	3000
2	Flat Plate Collectors (FPC) with liquid as the working fluid	3300
3	Flat Plate Collectors with air as the working fluid	2400
4	Solar collector system for direct heating applications	3600
5	Concentrator with manual tracking	2100
6	Non- imaging concentrators	3600
7	Concentrator with single axis tracking	5400
8	Concentrator with double axis tracking	6000

1. The capital subsidy/ unit collector area, as given above, is based on 30% of the benchmark costs, which would be reviewed annually. Capital subsidy would be computed based on the applicable type of solar collector multiplied by the collector area involved in a given solar thermal application/project.

2. Besides the capital subsidy as proposed above, the pattern of support could include a soft loan at 5%, as under:

- a) Soft loan @ 5% interest would be available, inter alia, for balance cost which may comprise installation charges, cost of civil work for large systems and costs of accessories (viz. insulating pipeline, electric pump, controllers and valves, additional water tanks, blower for air heating systems, drying trays for solar dryers, steam system, etc.), etc.
- b) To meet unmet demand for electricity and thermal energy or in un electrified rural areas, Solar thermal power plants and local distribution network, would be provided capital subsidy of 60% AND soft loan at 5% . These could be in either stand alone or co / poly generation mode

No.5/23/2009-P&amp;C

Dated 16.06.2010

**ANNEXURE-2****INCENTIVE FOR PROMOTIONAL ACTIVITIES BY BANKS/FIS FOR EXTENDING LOANS FOR PURCHASE OF SOLAR LIGHTS AND OTHER SMALL SOLAR OFF GRID SYSTEMS**

The range of no. Of systems to be financed by the banks in a year	3000-8000	8001-16000	16001-30000	Above 30000
<b>Minimum amount of lending to be eligible for seeking incentives</b>				
Minimum lending amount per year for the system	Rs. 3 crores	Rs. 8 crores	Rs. 16 crores	Rs. 30 crores
<b>Incentives for various activities</b>				
Capacity building	Rs. 3lakh	Rs. 4 lakh	Rs. 5 lakh	Rs. 10 lakh
Awareness generation	Rs. 15 lakh	Rs. 20 lakh	Rs. 25 lakh	Rs. 40 lakh
Cash prizes for best 3 Branches	Rs. 3 lakh	Rs. 3.5 lakh	Rs. 5 lakh	Rs. 10 lakh
<b>One time incentives to Banks/FIs participating for the first time in scheme</b>				
Documentation of best practices	Rs. 2 lakh	Rs. 2 lakh	Rs. 3 lakh	Rs. 5 lakh
Preparation of manuals for procedures, Software, etc.,	Rs. 2 lakh	Rs. 2 lakh	Rs. 3 lakh	Rs. 5 lakh
Monitoring & Learning	Rs. 2 lakh	Rs. 3 lakh	Rs. 5 lakh	Rs. 10 lakh

In addition to above, cash prize will be given @ Rs. 1.00 lakh to the village/village panchayat wherein village/villages have a coverage of 75% or more through solar lighting systems by the banks/FI. The Panchayats will be encouraged to utilize this money to purchase solar street lights or other devices for use of the village community. The Prize money could be routed through bank/F.I. to the village/village panchayat.

**ANNEXURE-3****MINIMAL TECHNICAL REQUIREMENTS/ STANDARDS FOR OFF-GRID/ STAND-ALONE SOLAR PHOTOVOLTAIC (PV) POWER PLANTS/ SYSTEMS TO BE DEPLOYED UNDER THE NATIONAL SOLAR MISSION****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           |
| Concentrator PV Modules & Assemblies       | IEC 62108           |
- 1.2 In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 - requirements for testing, for safety qualification.
- 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.

**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/ equivalent BIS Standards as specified below\*\*:

BoS item/component	Applicable IEC/equivalent BIS Standard	
	Standard Description	Standard Number
Power Conditioners/ Inverters*	Efficiency Measurements Environmental Testing	IEC 61683 IEC 60068 2 (6,21,27,30,75,78)
Charge controller/ MPPT units*	Design Qualification Environmental Testing	IEC 62093 IEC 60068 2 (6,21,27,30,75,78)
Storage Batteries	General Requirements & Methods of Test Tubular Lead Acid	IEC 61427 IS 1651/IS 133369
Cables	General Test and Measuring Methods PVC insulated cables for working Voltages up to and including 1100 V-Do-, UV resistant for outdoor installation	IEC 60189 IS 694/ IS 1554 IS/IEC 69947

\*\*Must additionally conform to the relevant national/international Electrical Safety Standards.

No.5/23/2009-P&amp;C

Dated 16.06.2010

BoS item/ component	Applicable IEC/equivalent BIS Standard	
	Standard Description	Standard Number
Switches/ Circuit Breakers/Connectors	General Requirements Connectors- safety	IS/IEC 60947 part I,II,III EN 50521
Junction Boxes/Enclosures	General Requirements	IP 65 (for outdoor)/IP 21 (for indoor) IEC 62208
SPV System Design	PV Stand-alone System design verification	IEC 62124
Installation Practices	Electrical installation of buildings Requirements for SPV power supply systems	IEC 60364-7-712

**\*\* Also refer Addendum No. 32/49/2010-11-PVSE dated 19.08.2010 appearing at the end of this document.**

### **3. AUTHORIZED TESTING LABORATORIES/ CENTERS**

3.1 The PV modules must be tested and approved by one of the IEC authorized test centers. Test certificates can be from any of the NABL/ BIS Accredited Testing / Calibration Laboratories. Qualification test certificate as per IEC standard, issued by the Solar Energy Centre for small capacity modules upto 37Wp capacity will also be valid.

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

### **4. WARRANTY**

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

4.2 PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

### **5. IDENTIFICATION AND TRACEABILITY**

5.1 Each PV module used in any solar power project must use a RF identification tag (RFID), which must contain the following information. The RFID can be inside or outside

the module laminate, but must be able to withstand harsh environmental conditions.

**No.5/23/2009-P&C**

**Dated 16.06.2010**

- (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.

**ANNEXURE-4****PRESENTLY AVAILABLE NATIONAL STANDARDS/ MNRE SPECIFICATIONS ON  
SOLAR THERMAL COMPONENTS/ SYSTEMS****A) Indian Standards**

National Standards are brought out by Bureau of Indian Standards. The details of these Standards which contain minimum performance requirements along with test methods are as follows:

**1. Solar Flat Plate Collectors**

- a) IS 12933 (Part 1):2003, Solar flat plate collector -Specification, Part 1 - Requirements.
- b) IS 12933 (Part 2):2003, Solar flat plate collector -Specification, Part 2 - Components.
- c) IS 12933 (Part 3):2003, Solar flat plate collector -Specification, Part 3 - Measuring instruments.
- d) IS 12933 (Part 5):2003, Solar flat plate collector -Specification, Part 5 - Test methods.

These Standards does not apply to concentrating & unglazed collectors and built-in-storage water heating systems.

**2. Box-Type Solar Cookers**

- a) IS 13429 (Part 1):2000, Solar cooker-Box type - Specification, Part 1 - Requirements.
- b) IS 13429 (Part 2):2000, Solar cooker- Box type - Specification, Part 2 - Components.
- c) IS 13429 (Part 3):2000, Solar cooker- Box type - Specification, Part 3 - Test methods.

**B) MNRE Specifications**

(Available on MNRE website [www.mnre.gov.in](http://www.mnre.gov.in))

1. Test Procedure for solar dish cookers
2. Test procedure for Thermo-siphon-type domestic solar Hot Water Systems

**No.5/23/2009-P&C****Dated 16.06.2010****C) Testing Laboratories/ Centers**

1 In order to make available quality product in the market, the Ministry works with Bureau of Indian Standards (BIS) and Quality Council of India. Presently, Indian Standards are available for solar flat plate collectors and box-type solar cookers and BIS implements a testing and certification programme which forms the basis of certification of these products by BIS.

2. For domestic size solar water heating systems based on thermo-siphon mode of operation, the Ministry has supported development of a test protocol with certain minimum performance requirements. For solar dish cookers, the Ministry has defined minimum specifications and has brought out a test procedure. In addition, the Ministry empanels manufacturers of solar water heating systems based on evacuated tube collectors.

3. There is a network of test centres in the country which is recognized by BIS for carrying out certification testing as per Indian Standards. The details of these test Centres are available are MNRE website and is updated from time to time.

4 The solar thermal devices/ systems must be tested at one of these test centres.

भारत सरकार  
नवीन और नवीकरणीय ऊर्जा मंत्रालय  
Government of India  
**MINISTRY OF NEW AND RENEWABLE ENERGY**  
ब्लॉक नं. 14, केन्द्रीय कार्यालय परिसर, लोदी रोड़, नई दिल्ली-110003  
BLOCK NO. 14, C.G.O. COMPLEX, LODI ROAD, NEW DELHI - 110 003

Fax : 011-24361298

Telegram : RENEWABLE

सं.

दिनांक

No. No. 32/49/2010-11-PVSE

Dated 19.8.2010.....

ADDENDUM

**Subject: Jawaharlal Nehru National Solar Mission – Guidelines for Off-grid and Decentralized Solar Applications – Minimal Technical Requirements/ Standards – addendum, reg.**

The undersigned is directed to refer to the Guidelines for Off-grid and Decentralized Solar Applications announced by the Ministry on 16<sup>th</sup> June, 2010 and to make the following additions in the Minimal Technical Requirements / Standards specified in Annexure-III thereof:

- (i) The existing Standard description and Standard Number in respect of **Storage Batteries** may be replaced as under:

Standard Description		Standard Number
General Requirements and Methods of Test	:	IEC 61427
Tubular Lead Acid	:	IS 1651 / IS 13369
Valve regulated Lead Acid (VRLA)	:	IS 15549

- (ii) Standards equivalent to those specified in respect of all Balance of System (BOS) Items will also be acceptable.
2. This issues with the approval of competent authority.

  
(Prem Chand)

Under Secretary to the Government of India