Scheme for Solar Off-grid (Photovoltaic & Thermal) & decentralized Applications.

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 would still require interventions to bring down costs but the key challenge would be 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 applications.

2.3 To encourage innovation in addressing market needs and promoting sustainable business models.

2.4 To provide support in flexible demand driven mode to channel partners and potential beneficiaries, within the framework of boundary conditions.

2.5 To create a paradigm shift needed for commoditization of off-grid solar applications.

2.6 To support consultancy services, seminars, symposia, training, 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 systems including hybrid systems to meet / supplement power, heating and cooling energy requirements. In respect of hybrid systems, only the component pertaining to solar energy would qualify for incentives under this scheme. In cases where there is a specific scheme for hybrid systems, (eg wind – solar), provisions thereof would apply. However, for the other Renewable energy component, the respective scheme for off grid would be the bench mark for calculating the subsidy. Initially, only solar wind hybrid and solar bio-energy hybrid 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 installation and off-grid and decentralized solar thermal applications as specified by the Government from time to time, to meet / supplement 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 installation would be supported.

3.3 Soft loans will be available to SME manufacturers of solar thermal systems in order to promote technology upgradation, for projects involving improvement in technology, expansion in production facilities, etc. through refinance facility to be implemented through IREDA. This facility would also be available for working capital loan requirements. The modalities of this component would be detailed separately.

vi) In order to promote technology up-gradation in SME, soft loans will be available to manufacturers of off grid solar thermal systems and BoS component in SPV for projects involving improvement in technology, expansion in production facilities etc. at an interest rate of 5% through refinance facility of IREDA. This facility would also be available for working capital loan requirements to these entities. The modalities of this component would be detailed out by IREDA as an Annex to this scheme.

3.4 A provision of 3% of the annual budgeted outlay shall be made for administrative expenditure, evaluation, studies, research & seminars, information dissemination, publicity, and for putting in an IT enabled monitoring mechanism, etc. An incentive scheme for banks has been detailed out in Annexure II.

3.5 An indicative list of applications/systems and boundary conditions thereof are at Annexures IA and IB.

4. Implementation Arrangements:

4.1 The Scheme would be implemented through multiple channel partners for **rapid upscaling 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 entire spectrum of funding. 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 below:

a) Renewable Energy Service Provider 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) FI s 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.

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' 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 by way of Interest Subsidy and/or Capital Subsidy within the boundary conditions as detailed in Annexures 1A and 1B.

5.3 The capital subsidy of 90% for special category States viz., NE, Sikkim, J&K , Himachal and Uttaranchal would be implemented and in addition , it would be extended for setting up only stand alone rural solar power plants/packs (both PV and thermal) in remote and difficult areas such as Lakshadweep, Andaman & Nicobar Islands, Ladakh region of J&K and districts on India's international borders. However, in these areas, funding for Solar thermal systems , the subsidy would be limited to 60% for Individual/Institutional/ commercial applications 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

5.4 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 portion.

5.5 Funds received by IREDA from MNRE without cost would be made available by way of refinance to the primary lending institutions at a rate of interest not exceeding two per cent per annum, 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 five per cent per annum.

5.6 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.

5.7 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.

5.8 MNRE would also fund IREDA for meeting the expenditure towards development of software and hardware, based on an estimate provided by IREDA, for implementing and monitoring the scheme effectively. IREDA would present an audited annual statement of accounts.

5.9 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 /homelighting systems with small wattage, upto 10% of the CFA would be admissible as institutional charges. These would be provided by MNRE ,in addition to the CFA .

5.10 The CFA from MNRE would not preclude the channel partners from availing other fiscal and financial benefits being provided 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 (Credit Linked)*
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 instalments 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.

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 progamme 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. <u>Approval Mechanism</u>
The Committee constituted by MNRE, would approve the project within 45 days of screening 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 within 2 weeks. 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.

9. <u>Project Management Consultant (PMC)</u>

The government would engage a reputed agency as a Project Management 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. They 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 by PMC, 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 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

The scheme would require the project proponents to strictly adhere to the national/international standards specified by the Ministry from time to time. Use of fully imported PV systems will not be permitted under the scheme. However, use of imported components of a complete PV systems would be permitted, subject to adequate disclosure and compliance to quality norms and standards.

12. Supporting Innovation

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

13. Interpretation of the Guidelines

In so far as 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 within the framework of boundary conditions.

Annex 1A

Ministry of New and Renewable Energy

National Solar Mission

Proposed Pattern of Support for Off-Grid Solar PV Applications

S. No.	Beneficiary Categories	Solar PV Capacity (Upper Limit)	Incentives	Illustrative Applications	Normative Systen Prices, for decidin incentive
1.	Individuals	5 kWp	Rs 90/ Wp Capital Subsidy **AND** soft loan at 5 % for balance cost	1.Solar lighting systems, including solar lanterns 2.Solar inverters 3.Solar power packs 4.Solar pumps for irrigation	**Systems with battery Storage** Rs.300 / Wp of PV module capacity (based on Rs.130/Wp P\ modul price, including installation commissioning and 5 year AMC
2.	Non-Profit Organizations / Institutions	100 kWp	Rs 90/Wp Capital subsidy **AND** soft loan at 5 % for balance cost	Solar lighting systems, including street lights Solar inverters Solar power packs / plants for lighting and computers in schools and hostels Solar systems for lighting and communication in Police Stations Solar systems for Vaccine Refrigeration in PHCs / Hospitals Solar drinking water supply systems for communities. Solar community irrigation systems	**Systems without battery Storag** Rs.210 / Wp of PV module capacity (based on Rs.130/Wp PV module price and including installation, commissioning and 5 years AMC)
3.	Commercial / Profit Making Organizations	100 kWp	Rs 90/Wp Capital Subsidy **OR** soft loan at 5 % for balance cost	Solar systems for Telecom Towers Diesel Abatement Systems in Commercial Establishments Solar lighting systems, including street lights Solar power packs / plants	

Special Area Projects:

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

For standalone rural SPV power plants/packs, to meet unmet demand for electricity or in unelectrified areas for

Annex 1B

1. Typical costs of different Type of Solar Thermal Collectors and Proposed Capital Subsidy

Typical cost of various solar collectors has been estimated as given below. These costs take into account some essential parts of solar thermal system, for example, water storage tank in a solar water heater, but do not include various other costs which become necessary on case-to-case basis for installation of these systems. For all general areas, capital subsidy would be calculated based on 30% of the benchmark costs of the applicable type of solar collector multiplied by the collector area involved in a given solar thermal application.

Solar Collector type	Typical cost (Rs/sq.m.)	Typical Efficiency (%)	Cost (Rs/MWth)	Capital Subsidy @ 30% of Cost (Rs/sq.m.)
Evacuated Tube Collectors (ETCs)	10000	40	3.57	3000
Flat Plate Collectors (FPC) with liquid as the working fluid	11000	40	3.93	3300
Flat Plate Collectors with air as the working fluid	8000	30	3.81	2400
Solar collector system for direct heating applications	12000	35	4.90	3600
Concentrator with manual tracking	7000	30	3.33	2100
Non-imaging concentrators	12000	40	4.29	3600
Concentrator with single axis tracking	14000	40	5.00	4200
Concentrator with double axis tracking	18000	50	5.14	5400

2. **Balance Cost:** Soft loan @ 5% interest would be available interalia for balance cost which may comprise of the 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.), cost of civil work for large systems, balance cost of collectors and installation charges etc.

3. The proposed pattern of support for various categories of beneficiaries could be capital subsidy as proposed above AND a soft loan at 5%. For standalone rural solar thermal power plants, to meet unmet demand for electricity or in unelectrified areas for communities, based on revenue model, capital subsidy of 60% AND soft loan at 5% ,would be available for balance cost.

Annex 2

Incentive for Promotional Activities by Banks/FIs for Extend 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
Minimum amount of lending to be eligible for seeking incentives				
Minimum lending amount per year for the system	Rs. 3 crores	Rs. 8 crores	Rs.16 crores	Rs. 30 crores
Incentives for various activities				
Capacity building	Rs. 3 lakh	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
One time Incentive to Banks/FIs participating for the first time in the scheme				
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.