**IMMEDIATE/**
**Reminder**

No.30/18/2014-15-NSM

**भारत सरकार/ Government of India**

**नवीन और नवीकरणीय ऊर्जा मंत्रालय / Ministry of New & Renewable Energy**

(NSM Coord. Group)

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Block 14, CGO Complex, Lodi Road,
New Delhi-03, Dated 8th September, 2014

To

All Energy Secretaries/ Energy Departments of States
(as per standard list)

**Subject: Draft Scheme for development of Solar Parks and Ultra Mega Solar power projects – circulation for comments reg.**

Sir/Madam,

I am directed to refer to this Ministry's earlier letter of even number dated 1st August, 2014 (copy attached) enclosing a draft Scheme on the above subject for furnishing comments/suggestions thereon. However, reply/comments in this regard are still awaited from SNAs. It is, therefore, once again requested to expedite submission of comments/reply to this Ministry without any further delay, on Email ID: *adityanand.s@nic.in* or through Fax No. 011-24363498.

(A.N.Srivastava)
Director
Telefax: 24363498

**Encl: As above.**

Copy to:-

(i) PSO to Secretary, MNRE
(ii) PPS to JS(TK)
(iii) Dir.(NIC) for uploading on MNRE website

**MOST IMMEDIATE**

No.30/18/2014-15-NSM

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Block 14, CGO Complex, Lodi Road,
New Delhi-03, Dated 1st August, 2014

To

All Energy Secretaries/ Energy Departments of States
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**Subject: Draft Scheme for development of Solar Parks and Ultra Mega Solar power projects – circulation for comments reg.**

Sir/Madam,

I am directed to forward herewith a draft Scheme on the subject noted above with the request that the comments/suggestions, if any, thereon may kindly be forwarded to this Ministry as soon as possible on Email ID: *adityanand.s@nic.in* or through Fax No. 011-24363498.

(A.N.Srivastava)
Director
Telefax: 24363498

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# Scheme for development of Solar Parks and Ultra Mega Solar Power Projects

## 1. Background

India, with its large population and rapidly growing economy, needs access to clean, cheap and reliable sources of energy. India lies in the high solar insolation region, endowed with huge solar energy potential with most of the country having about 300 days of sunshine per year with annual mean daily global solar radiation in the range of 4.5-6.5 kWh/m2/day. Solar power projects can be set up anywhere in the country, however the scattering of solar power projects leads to higher project cost per MW and higher transmission losses. Individual projects of smaller capacity incur significant expenses in site development, drawing separate transmission lines to nearest substation, procuring water and in creation of other necessary infrastructure. Also it takes a long time for project developers to acquire land, get change of land use and various permissions, etc. which delays the project.

The solar park is a concentrated zone of development of solar power generation projects, by providing to developers an area that is well characterized, properly infra-structured and where the risk of the projects can be minimized as well as the facilitation of the permitting process.

Starting with the 'Charanka Solar Park' in Gujarat, and closely followed by the 'Bhadla Solar Park' in Rajasthan, solar parks have quickly emerged as a powerful instrument for the rapid development of solar power projects in the country. These parks have obtained their initial impetus from the Jawaharlal Nehru National Solar Mission (JNNSM), which provided the policy framework and roadmap for solar power development in the country.

Charanka Solar Park in Gujarat is an example, envisioned as a pioneering first-of-its-kind large scale solar park in India with clear land and transmission connectivity. A solar power developer can get fully developed land along with transmission facilities and can, therefore, set up a power project immediately. The solar park has a capacity of 590 MW, out of which 224 MW has already been commissioned by 20 developers.

The solar parks in Gujarat and Rajasthan not only enable the states to meet their policy targets for solar power and renewable purchase obligations, they also contribute towards the ambitious targets put in place by the JNNSM. In addition, the clean power generated by these solar projects play a role for reducing India's carbon footprint, promote high end technical investments and empower local communities. MNRE, through this scheme will target development of similar solar park across India.

Large size projects have a potential to bring down the cost of Solar Power. Therefore Ultra Mega Solar Power projects each having capacity of 500 MW or above have been planned in India. Large chunks of land are available in some States. There are some developers who are keen to take up their very large projects. Land has been identified in Gujarat, Rajasthan, J&K (Leh and Kargil) and Madhya Pradesh.

## 2. Proposal

MNRE through this scheme plans setting up 25 solar parks, each with a capacity of 500 to 1000 MW; thereby targeting around 20000 MW of solar power installed capacity. These solar parks will be put in place in a span of 5 years and the solar projects may then come up as per demand and interest shown by developers.

At the state level, the solar park will enable the states to bring in significant investment from project developers, meet its Renewable Purchase Obligation (RPO) mandates and provide employment opportunities to local population. The state will also reduce its carbon footprint by avoiding emissions equivalent to the solar park's installed capacity. Further, the state will also avoid procuring expensive fossil fuels to power conventional power plants of equivalent installed capacity.

The solar park will provide a huge impetus to solar energy generation by acting as a flagship demonstration facility to encourage project developers and investors, prompting additional projects of similar nature, triggering economies of scale for cost-reductions, technical improvements and achieving large scale reductions in GHG emissions. Some Ultra Mega projects may be set up in these Parks or entire parts may be an Ultra Mega Power Projects.

**2.1 Applicability:** All the states and Union territories are eligible for benefits under the scheme.

**2.2 Capacity:** Park to be taken up for development should be of minimum capacity of 500 MW and a maximum capacity of 1000 MW. Smaller parks of 100 MW and above may be considered in NE, HP, Uttarakhand and J&K. Smaller parks of 100 MW and above may also be considered in UT's and small States with population less than 2 crores. Higher than 1000 MW capacity parks may also be considered under special circumstances.

## 3. Implementation agency

The solar parks will be developed in collaboration with the State Governments. The implementation agency would be Solar Energy Corporation of India (SECI) on behalf of Government of India (G0I). SECI will handle funds to be made available under the scheme on behalf of GOI.

The states applying under the scheme will have to designate an agency for the development of solar park. Solar parks are envisaged to be developed in the following modes:

i. The state designated nodal agency undertakes the development & management of the solar park, under the general guidance and supervision of SECI.

ii. The Joint venture between state designated nodal agency and SECI undertakes the development & management of solar park

iii. The state designates SECI as the nodal agency and SECI undertakes the development and management of solar park on its own.

iv. Any of the above three alternatives with a private sector partner with a condition that at least 51% of the equity will remain with SECI+ State designated agency. There will be an implementation agency setup as above.

The implementation agency, as identified under provisions at (i) to (iv) above, shall undertake following activities to achieve the objective of speedy establishment and implementation of Solar Power Parks in the State.

i. Develop, plan, execute, implement, finance, operate and maintain the Solar Power Park
ii. Identify potential site and to acquire/possess land at potential sites for Solar Power Park
iii. Carry out site related studies/investigations
iv. Obtain statutory & non statutory clearances and to make area development plan within Solar Power Park.
v. Design a plan for sharing development cost between the developers and the park
vi. Create necessary infrastructure like water, transmission lines, roads, drainage etc. to facilitate Solar Power Project developer for faster implementation of Solar Power Projects
vii. Frame out transparent plot allotment policy and specify procedures pursuant to the relevant State policies and their amendments thereof.
viii. Provide directives for technology-specific land requirements
ix. Engage the services of national/global experts/consultants to promote Solar Power Park related activities
x. Facilitate the State Government to establish educational institutions/training facilities within Solar Power Park for development of manpower skill related to Solar Power
xi. Any other activities related to Solar Power Park as per the directives from MNRE and the State Government.
xii. Conduct the necessary evaluation and pre-permitting of the environmental and social impacts of utility scale solar deployment before allocating the land to prospective developers

## 4. Land acquisition / site selection

Land for the setting up of the solar park will be identified by the State Government. It will be the responsibility of the State Government to make the land available. States are encouraged to identify sites receiving good solar radiation and sites which are closer to CTU (i.e. Power Grid), preferably locations with spare solar installed capacity and water availability. The park must have at least 5 Acres per MW towards installation of solar projects.

In order to provide for such a large tract of contiguous land with appropriate insolation levels, the state government may prioritize the use of government waste/non-agricultural land in order to speed up the acquisition process. It will be preferred if most of the required land is Government owned and very little private land is to be acquired. The price of the land is to be kept as low as

possible in order to attract the developers and, therefore, the site should be selected in such a manner so that inexpensive land can be made available. If land cannot be made available in one location, then land in few locations in close vicinity may be taken.

## 5. Facilities to be provided

The solar park will provide specialized services to incentivize private developers to invest in solar energy in the park. These services while not being unique to the park, are provided in a central, one-stop-shop, single window format, making it easier for investors to implement their projects within the park in a significantly shorter period of time, as compared to projects outside the park which would have to obtain these services individually.

The implementing agency is tasked with acquiring the land for the Park, cleaning it, levelling it and allocating the plots for individual projects. Apart from this, the agency will also be entrusted with providing the following facilities to the solar project developers for the development of the solar park:

i. Land approved for installation of solar power plants and necessary permissions including change of land use etc.
ii. Road connectivity to each plot of land
iii. Water availability for construction as well as running of power plants and demineralization plant
iv. Flood mitigation measures like flood discharge, internal drainage etc.
v. Construction power
vi. Telecommunication facilities
vii. Transmission facility consisting pooling station (with 400/220, 220/66 KV switchyard and respective transformers) to allow connection of individual projects with pooling station through a network of underground cables or overhead lines.
viii. Housing facility for basic manpower wherever possible
ix. Parking, Warehouse etc.

The solar park will be a large contiguous stretch of land with high insolation levels, saving the private developer from making the effort of finding the ideal site for the plant. In addition, the site within the park is already levelised and developed reducing these costs for the project developer.

In addition, the Park will provide road access (both approach roads and smaller access roads to individual plots), water (via a dedicated reservoir located within the premises), boundary fence and security, each of which would have entailed additional costs for the developer outside the park.

Each of these specialized services offer significant benefits to the developers but come at a premium. Land plots within the solar park are more expensive than outside. But this premium is easily justifiable by these services, which bundled into the land cost. However, the most important benefit from the park for the private developer is the significant time saved. The centralized, single window nature of the services within the park reduces the time between project conceptualization

and operations, translating into economic and real monetary gains for the private developers and the state.

## 6. Financial model

The implementation agency, entrusted with implementing the programme will get the land developed and provide necessary infrastructure like road connectivity, transmission infrastructure etc. Significant investments will also be made in the operation & maintenance of the solar park, employing staff and other activities like marketing activities etc. The entire cost of development including cost involved in acquisition of land will form the total cost for the project for which an estimate will be prepared beforehand by the nodal agency. Based on this estimate the nodal agency will formulate a recovery model to ensure the sustainability of the model. The nodal agency may raise the funds as follows:

- The implementation agency may sell/lease out the plots to prospective project developers. The Allotment Price per metre square (inclusive of all applicable taxes, duties, cess etc.) payable by the plot applicant for the applications must be specified beforehand. The allotment price may be reviewed annually and an annual increment may also be specified. The maximum stretch of plot to be allotted will be decided as per the benchmarks finalized by the nodal agency.
- A one-time registration fee (per project or per MW) may be collected by inviting applications from the prospective buyers when the scheme is finalized, land identified and marked. An advance may be collected from the prospective buyers when 50% of the land is acquired. This advance will be 10% of the sale price. Another instalment of 25% of the price of land may be taken when full land is acquired. Further instalments may be collected while plot are being developed. Final 15% may be collected at the time of allotment of the plot to the buyer.
- The implementation agency may put in some of its own equity and can raise loans, depending on the availability of funds and requirement. The subsidy of MNRE under the scheme would bring down the cost of the project to that extent. The SPV will also create a small corpus fund to ensure upkeep and maintenance in the future, which may be supplemented with some annual charges.

## 7. MNRE support

The State Government will first identify the nodal agency for the solar park and will also identify the land for proposed solar park. Thereafter it will send a proposal to MNRE for approval. After the solar park is approved by MNRE, the implementing agency may apply for a grant of Rs. 25 lakhs for preparing DPR, conducting surveys etc. Thereafter application may be made for the grant at the rate of up to Rs.20 lakhs/MW or 30% of the project cost including grid connectivity cost whichever is lower, which will be released as per the following timelines:

| S. No. | Milestone | Timeline | % of subsidy disbursed |
|---|---|---|---|
| 1 | Date of issue of administrative approval | Day 0 | 5% |
| 2 | Land acquisition (50% land acquired) | 5 months | 20% |
| 3 | Financial Closure | 8 months | 20% |
| 4 | Construction of Pooling Substation, Land Development and other Common facilities as per DPR | 15 months | 25% |
| 5 | Transmission line and Grid Connectivity | - | 20% |
| 6 | Final installment on completion | - | 10% |

The grant will be managed and released by SECI on behalf of MNRE for which SECI will be given a fund handling fee of 1%. If the park is developed in phases, grant will also be phased out in proportion to expenditure in each phase.

Based on above, the estimated cost has been worked as under:-

| | **(Rs. in Crores)** |
|---|---|
| (i) Cost of 20,000 MW @ Rs.20 Lacs/MW | 4000.00 |
| (ii) 1% fund handling fee for SECI on above amount | 40.00 |
| (iii) Cost of DPR preparation etc. for 25 Solar Parks @ Rs. 25 Lacs each park | 6.25 |
| **Total** | **4046.25** |

## 8. Transmission and evacuation of power from solar park

Interconnection of each plot with pooling stations through 66 KV /other suitable voltage underground or overhead cable will be the responsibility of the solar project developer.

The designated nodal agency will set up the pooling stations (with 400/220, 220/66 KV or as may be suitable switchyard and respective transformers) inside the solar park and will also draw transmission to transmit power to 220 KV/400 KV sub-station.

The responsibility of setting up a sub-station nearby the solar park to take power from one or more pooling stations will lie with the central transmission utility (CTU) or the State transmission utility (STU), after following necessary technical and commercial procedures as stipulated in the various regulations notified by the central/state Commission.

If the state government is willing to buy substantial part of the power generated in the solar park, preference will be given to STU, which will ensure setting up of sub-station and development of necessary infrastructure for transmission of power from substation to load centres.

If the state is not willing to buy substantial power generated in the solar park, then CTU may be entrusted with the responsibility of setting up 400 KV sub-station right next to the solar park and its connectivity with the CTU. For setting up of this transmission & evacuation infrastructure, Power Grid may prepare a separate project to be funded from NCEF / external funds / Green Corridor project, if the cost is very high. The system would be planned in such a manner so that there is no wheeling charge applicable on solar power in accordance with the CERC Regulation in this regard or they are very low.

To build this infrastructure using the highest possible standards, the whole solar power evacuation network scheme may be designed using latest technologies like SCADA, GIS, Bay controller, Online monitoring equipment for dissolved gas analysis, OPGW, PLCC etc.

**9. Power sale arrangement**

Acceptance for development of solar park under the scheme does not guarantee Power purchase agreement (PPA) or a tariff for the power to be produced. The project developers have his own arrangements for a PPA or get selected in any Government of India or State Government scheme. The developer will be free to set up projects under any scheme or for third party sale.

**10. Loan**

MNRE will also put in efforts to tie up with multilateral/ bilateral funding agencies to finance the entire or a part of the cost of the solar parks. The MNRE grant will be treated as the developers' contribution to get this loan. The loan tenure and the moratorium period will be set in accordance with the banks' terms and conditions while the annual interest will be set in accordance with banks' LIBOR-based lending facility.

**11. Funding Connectivity**

The connectivity with grid i.e. 220/400 KV substation and transmission line to connect with CTU / STU's, existing network will be an important component. For the same, money out of the MNRE grant may be used. The loan from multilateral or bilateral agencies may also have a component to fund connectivity. If the expenditure is high than a separate proposal may also be considered for funding from NCEF, Green Corridor Programme or any other source.

**12. Equity Contribution**

Minimum up front equity will be required to setup the implementing agency as most of the costs will be covered through MNRE grant and loan. Most of the land is expected to be Government Land. The expenses on land can be recovered and paid from sale proceeds gradually.

The surplus money that will accrue from sale may be converted into equity of promoters so that the implementing agency gets a financial strength for long term sustenance.

**13. Ultra Mega Solar Power Projects**

Ultra Mega Solar Power project is defined as a single power project with capacity of over 500 MW. These projects may be set up in some of these Solar Parks. The projects may be bid out after developing the park or simultaneously with park developments. In some cases full park may be one Ultra Mega Project.

In such cases the J.V. set up to develop the Ultra Mega Solar Projects may become the implementing agency also.

**14. Hybrid Projects**

Some other forms of RE like wind biomass etc. may also be allowed to come up in the park wherever feasible.

**15. Manufacturing**

Manufacturing of solar products and components may also be allowed in the parks.

## 16. Interpretation

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

## 17. Arbitration

Any dispute arise out of any provision of the scheme, shall be settled by an Arbitrator appointed by this Ministry for the purpose and his decision shall be final and binding.

## 18. Power to remove difficulties

If there is need for any amendment to this Scheme for implementational problems, MNRE will be competent to make such amendments with the approval of Minister-in-charge.

## 19. State Government's obligation to purchase power:

The State Government in which the solar park is developed must agree to buy power through its Discom at least 20% of the power produced in the Park. The States which agree to bring higher percentage of power will be given preference. In case the State refuses to buy power then connectivity with CTU systems has to be ensured. If connectivity with CTU system is through STU system then State will agree to wave wheeling charges.

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