

Implementation of Scheme for Assistance to
State PSEs towards Grid Connected
Distributed Solar Power Project on
Agriculture/Gauchar/ Waste Land

Government of Gujarat,
Energy & Petrochemicals Department
G.R. No: SLR-11-2015-15-B,
Sachivalaya, Gandhinagar
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MD Cell, PGVCL, Rajkot.

Preamble:

1. The Ministry of New and Renewable Energy (MNRE), Government of India set a highly ambitious target of setting up 100000 MW of Solar Power generation capacity in the Country by 2022 against current total installed capacity of approximately 3000 MW.

2. Gujarat has one of the best potentials for solar power generation because of High DNI (Direct Solar Irradiance). Besides, based on the projected total energy consumption of the State by the year 2022 the share of Gujarat, based on uniform percentage of solar RPPO at national level, has been tentatively indicated by MNRE at around 8000 MW out of the targeted 100000 MW.

3. Large Solar Parks have its own merits and demerits. Such Solar Parks require huge land, huge investment in HV/EHV power Transmission and evacuation networks from such parks. Transformation losses in stepping up to transmit and stepping down again to distribute to the consumers, the transmission losses and transmission charges add significant amount to the consumers and or to the Public exchequer as these costs have to be absorbed by someone within the economy.

4. Though large size solar parks along with EHV evacuation system will be required for power to be sold outside the State (i.e. generation beyond the requirements of the State), for meeting the RPPO requirements of our DISCOMS the State will have to explore the cheapest option available.

5. Distributed solar generation of 1 MW to 4 MW at single location could be evacuated and directly distributed through the existing 11 KV networks of the DISCOMS. This will eliminate the cost of setting up EHV sub-stations and transmission system, thereby reducing costs of capital investments, and transformation and transmission losses at Transmission system at 66 KV and above

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level will also get avoided. State Government DISCOMS are going to take up strengthening and expansion of 11KV networks in the coming years through GOI funded DDUGJY scheme to improve reliability and stability of the Distribution system at 11 KV and below. This will further make grid connected distributed solar generation more reliable.

6. It is proposed to set up pilot distributed solar power plant on Govt wastelands or gaucher lands or agriculture lands depending on availability of lands for such pilot projects. Reliable water supply is required to clean the photovoltaic panels periodically to maintain their efficiency. The same water can be conveniently used for irrigation for production of crops, grass, vegetables etc form the same land.

7. The shadow analysis done using computerized software indicate significant potential for utilization of the pilot project land for production of various types of crops, vegetables and grass/fodder. However, selection of crops, vegetables, grass etc for the pilot experiment and their cultivation will require the help of Agriculture Universities or other expert agencies. Preliminary discussions have been held and the four Agriculture Universities of Gujarat have shown interest to be associated with this project. It is expected that this project would also be useful for the Universities in education and research fields.

8. Some advantages of Grid connected distributed Solar Power generation system are:

- I. Generation of Electricity very near to load centre and evacuation at 11 KV level will result in savings in transmission loss of around 4%. (Saving of Rs 0.24 per kwh considering tariff Rs 6.00 / kwh).
- II. Evacuation and Transmission of the power at 11 KV system will avoid huge costs involved in creation of sub-stations of 66KV / 220 KV / 400 KV level.
- III. Substantial savings of about Re 0.64 per kwh in transmission charges for use State Transmission Utility (STU) network.
- IV. Small pieces of waste lands at various locations/ Villages can be utilized for productive use like fodder/ crop production in addition to renewable power generation.
- V. The Gaucher lands under the care of Gram Panchayats are normally poorly maintained and productivity of fodder/ grass is also usually low. Utilization of gaucher land for solar power plants along with provision for scientific cultivation could help increase production of fodder/ grass as water used for regular washing of solar panels could also be used for irrigation water for grass/ fodder production. Micro irrigation system could be set up with 1% of the cost of the project.

- VI. If the solar power plant could be set up in agriculture land without reduction of crop production from the same land through adoption of micro irrigation and scientific cultivation (cultivable area will slightly go down, but productivity could be increased to maintain or increase total production with the help of more scientific and better irrigation practice), it would provide significant additional source of income for the farmer either in the form of rental income from land share in the solar power generation, even if a third party set up the solar power plant. It would act as excellent draught mitigation measure as the farmer would still get income by way of lease rent/ share of power even if the crops fail due to draughts etc.
- VII. It will result in creation of employment opportunities to local people.
- VIII. Distributed solar power generation projects will have low gestation period.
9. The disadvantage of Decentralized Solar Power Project is that ,the O&M cost per MW of distributed solar project could be marginally higher compared to big solar park as it would not have economies of scale which big solar park would have. However, the benefits are expected to out weight the disadvantages.
10. The requirements for lands being high for solar plants, pilot project will also have the purpose of demonstrating that -
- (i) Agriculture lands could be used for solar power generation without affecting agriculture production,
 - (ii) Gaucher lands could be used for solar power generation while at the same time enabling increased production of grass/ fodder,
 - (iii) Government wastelands could be used for solar power generation while at the same time utilizing such wastelands for more productive use like production of fodder or agriculture crops.
11. For this purpose, the pilot projects will have components for demonstrating these purposes. Selection of the pilot project sites will depend on the availability of land and possibility of achieving any one of the above three purposes.
12. Selection of sites for pilot projects may be done in consultation with the land owners. The agencies implementing the pilot project may also use their own lands wherever feasible.
13. The estimated capital cost of the pilot project, **inclusive of land preparation for cultivation and associated micro irrigation system**, is Rs 6.25 crores/ MW/

14. It is proposed that the project implementing agency shall be provided grant of Rs 4.00 crores/ MW. The balance amount required for completion of the project shall be mobilized by the implementing agency from other sources.

The project is intended to be not for profit but research and development and experimental project for the long term and larger benefit to the power sector. The Implementing Agencies are expected to carry out the works as part of enhancement of organizational knowledge and expertise.

15. To ensure that there is no extra burden to electricity consumers, it is proposed to sale power to discoms at the prevailing **Average Pool Purchase Cost (APPC)** at the time of commissioning of the Project and the same shall be escalated by Re 0.05/Kwh every year for the first 20 years and for last five years tariff will remain constant. PPA will be signed between the project implementing agency and the concerned DISCOM for a period of 25 years.

16. A provision of Rs 20/- crores have been made as new item in the BE for 2015-16 under ~~11-01-01-280-80-19/03~~

17. It is decided to set up 5 pilot projects of 1 MW each covering different geographical locations across Gujarat. i.e 1 MW Distributed solar plant each at North Gujarat, Madhya Gujarat, Saurashtra, Kutch and South Gujarat.

18. Implementation Agencies for these pilot projects will be as indicated below.

(i) GPCL : North Gujarat

(ii) GEDA and GIPCL : Central Gujarat

(iii) GSECL : Saurashtra Area

(iv) GSECL : Kutch Area

(v) GIPCL : South Gujarat

19. The Implementing Agencies (IAs) shall tie up and finalise collaboration details with the Agriculture Universities (AUs) and /or Expert agencies in agriculture. Agreement/ MOU shall be signed between IA and Aus and such MOU shall take into account the following.

(i) The roles and responsibilities of IAs and the AUs shall be clearly laid down.

(ii) The realization form sale of power shall be earmarked separately for (a) debt servicing (b) O&M of power plant (c) expenditure related to crop cultivation/ experiment including input costs, costs of AU for experts and direct related expenses (d) reserve fund to be maintained with the IA for meeting future contingencies related to this project. Reserve funds will be subject to surplus after meeting (a), (b) and (c).

(iii) Any other matter which are required for the successful and sustained running of the pilot project, keeping in mind that the project has two equally important elements (a) power generation and (b) cultivation of crops.

(20) The process for implementation of the power generation plant shall be started immediately by the IAs without waiting for the details of agreement/ MOU between IAs and Aus. The process of finalizing the MOU will however be pursued by the IAs concurrently.

(21) The IAs shall ensure that there is close coordination amongst them during implementation of solar power project and during O&M phase. Close and regular interaction and experience sharing shall be done for the success of the project.

(22) Accordingly, the Implementing Agencies will implement the scheme keeping in mind the objectives and modalities indicated above.



(P.L.Panchal)

Deputy Secretary to Govt. of Gujarat
Energy & Petrochemicals Department

To,

1. PS to Hon. Min(Energy), Sachivalaya, Gandhinagar
2. PS to Hon. Minister of State for Energy , Sachivalaya, Gandhinagar
3. Managing Director, Gujarat Urja Vikas Nigam Ltd., Vadodara
4. Managing Director, Gujarat Industrial Power Corporation Ltd., Vadodara
5. Managing Director, Gujarat State Electricity Corporation Ltd., Vadodara
6. General Manager, Gujarat Power Corporation Ltd., Gandhinagar
7. Director, Gujarat Energy Development Agency, Gandhinagar
8. Managing Director, Gujarat Energy Transmission Corporation Ltd., Vadodara.
9. Managing Director, Uttar Gujarat Vij Company Ltd., Mehasana
10. Managing Director, Madhya Gujarat Vij Company Ltd., Vadodara
11. Managing Director, Daxin Gujarat Vij Company Ltd., Surat
12. Managing Director, Paschim Gujarat Vij Company Ltd., Rajkot
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