INFORMATION BROCHURE

FOR

Grid Connected Agricultural PUMPS

UNDER COMPONENT- C1 (IPS) OF PM-KUSUM SCHEME

Project for Solarization of 200 Grid-Connected Individual Agricultural Pumps

Funding Structure

MNRE, Government of India Share (Approximately 9%)

Punjab Government Share (Approximately 81%)

Farmer Share (10%)

Punjab is an agricultural state and contributes approximately 60% of India's foodgrain production. This achievement is supported by a robust irrigation network, electric motor pumps and diesel pump sets. The Punjab Government is working on a unique pilot (Research and Development) scheme for solarization of individual pumps under the innovative scheme PM-KUSUM Component-C1.

Key features of the pilot:

1. Scale: Solarization of about 200 electric pumps (average ~ 15 HP) as a pilot in 3 feeders: 11 KV Peerkot feeder (District- Bathinda), 11 KV Kurali Feeder (District- S.A.S. Nagar), and 11 KV Rangiya Feeder (District- Sangrur)

2. Pump Replacement: Existing pumps will be replaced with energy-efficient AC pumps of equivalent capacity

3. Net billing: Bi-directional meters and solar energy smart meters will be installed to monitor solar generation, solar export and grid electricity consumption for irrigation. Farmers' pumps will always have electricity available during the day, these will also be powered by solar energy. The pumps will get grid power only when there is a decrease in solar generation. The excess solar generated energy will be exported back to the grid. The farmer will be given a "net bill" and will be paid for the net energy exported to the grid. Even if the farmers take net electricity from the grid for agriculture, they will not have to pay any payment. The feeders selected for this project will be kept operational during the day. The cost of installation of bi-directional meters and solar energy smart meters has been made part of the total cost of the project. The responsibility of replacing the faulty meters has been fixed at PSPCL.

4. Compensation to farmers: A formal contract of 25 years will be signed with the farmers, in which they will be able to sell the excess solar energy at an incentive of ₹2.5 per unit for the first 5 years and ₹2/- per unit for the subsequent 20 years. The high incentive during the initial five years, (₹2.5 per unit) is designed to enable the farmers to recover their investment in the pilot project quickly. After this period, the incentive has been reduced (₹2 per unit) which also reflects the expected decline in renewable energy costs over time, which will make power available at more competitive rates.

The payment to the farmers under the pilot project will be made by the Punjab Government as an incentive which will not require regulatory approval. However, for future scaling of the project, a decision on the payment to the farmer will be taken only after learning from the pilot and evaluating its results and impact.

5. Farmers' Payment: To increase the attractiveness of farmers, the payment of income will be distributed half-yearly which is February-July and August-January. These half-yearly payments are designed to be linked to the efficient use of pumps and the timing of energy consumption, especially June-July and August-September which are the peak months of solar energy, they are distributed equally in the above half-yearly.

6. Operational Support: There will be a mobile app for real time monitoring of energy generation, extraction and consumption by the participating farmers to help them in getting maximum benefits from the pilot scheme.

7. Increase in Solar Generation or Pump Capacity: In case the water table comes down, the farmers will be able to increase the solar and pump capacity at their own cost, subject to relevant approvals.

8. AMC Cost: AMC (Maintenance) costs for the initial five years will be covered under the project cost. The shortlisted vendor selected through the tendering process will provide maintenance services for this initial period of five years. After this period, the farmer will have to bear the maintenance costs at his own cost.

9. Public Hearings and Awareness Camps: Public hearings and awareness camps will be organized by PSPCL for the farmers at 03 feeders identified by PSPCL. These initiatives will aim to address farmers' concerns and encourage their participation by raising awareness about the benefits of the pilot project.

10. Farmer Training on System Maintenance: Farmers will be trained by PEDA on maintenance of the entire solar pumping system to ensure long term operation and efficiency.

11. Management of surplus energy exported against agricultural subsidy: The surplus solar energy exported to PSPCL grid (from 11 kV feeder to busbar of PSPCL grid) will be fed into PSPCL grid where it will be adjusted against the total agricultural subsidy of the government. Along with this PSPCL can claim compensation/handling expenses for possible distribution costs, maintenance etc. However, these costs will be applicable when the project is scaled up but for the purpose of the pilot project, these have been left out.

The benefits of this scheme are as follows: -

i. Conservation of groundwater.
ii. Solarization of agricultural energy.
iii. Reduction in the burden of state agricultural power subsidy!
iv. Reduction in transmission and distribution losses.
V. Increase in farmers' income.
vi. Generation of clean, green and affordable energy.
vii. Reduction in carbon footprint.
viii. Fulfillment of Renewable Energy Procurement Responsibility (RPO).

Implementation of the Pilot Project Various departments will play their role in the implementation of this pilot project:

1. Punjab Energy Development Agency (PEDA)

a) PEDA will lead the complete design, field implementation, monitoring and capacity building for the successful implementation of the pilot project.
b) PEDA, which is the State Implementing Agency (SIA) for PM-KUSUM scheme in Punjab, will issue RfP to take vendors on board for supply and maintenance of grid-connected solar pump sets, with 5 years AMC to be provided by the selected vendor.
c) PEDA will monitor and ensure the installation, effective operation and AMC of the solar power pump systems.
d) PEDA will partner with MNRE GoL for issuance of CFA.
e) PEDA will ensure all financial calculations related to the pilot project such as collection of funds from GoP and farmers and payment to farmers for energy export.
f) PEDA will pay the farmers for the excess energy generated by them and fed back into the state grid, as per the final scheme guidelines. g. PEDA will provide training on maintenance of the entire solar pump system to the farmers involved in the pilot project, to ensure its long-term performance and efficiency.

2. Punjab State Power Corporation Limited (PSPCL)

a) PSPCL shall identify the feeders on which the pilot project is to be implemented.
b) PSPCL shall select the farmers who will come on board for the pilot project and shall also enter into an agreement with the participating farmers to pay their contribution under the scheme.
c) PSPCL shall provide two-way net metering facility at the pumps of the participating farmers.
d) PSPCL shall ensure that there is no disruption in power supply to the farmers, provide additional transmission lines if required and ensure effective disposal of excess energy.
e) PSPCL shall provide necessary support for the successful implementation of the pilot project.
f) PSPCL shall provide assistance in selection of pumps, overall effective implementation and obtaining the following data points for evaluating the pilot:
g) Current consumption of selected pumps
h) Water flow rate of selected pumps
i) Ground water table in the area of selected pumps
j) PSPCL shall ensure all energy metering related to the pilot project such as solar energy generation, energy consumption by farmers, energy export etc.
k) PSPCL shall provide complete semi-annual data on energy metering and net energy export to PEDA to facilitate calculation and payment of incentives to farmers.

i. PSPCL shall, in collaboration with PEDA and Department of Agriculture and Farmers Welfare, conduct public hearings and awareness camps for farmers at 03 feeders identified by PSPCL and motivate them to participate in the pilot.