

Annexure A:

Technical specifications for the pump manufacturers

The “Indo-German Energy Programme - Renewable Energy Component” (IGEN-RE) is a bilateral technical cooperation measure between the Federal Ministry for Economic Cooperation and Development (BMZ), Government of Germany and the Ministry of New and Renewable Energy (MNRE), Government of India. This project aims at improving the conditions for private investment in providing access to clean energy in rural areas from renewable energy sources. BMZ has commissioned GIZ with the implementation of the project. GIZ is a federal enterprise based in Eschborn and Bonn, Germany.

Objectives of the project

The objective of the project is to replace two diesel pumps with two solar pumps and to highlight the benefits of using solar pumps to improve community farming in Vaishali district of Bihar.

GIZ would like to procure one AC and one DC solar centrifugal submersible pump (ranging between 5 HP to 7.5 HP depending on the specific site) to replace the existing diesel pump sets.

Technical Specifications

We would require the technical specifications and price of solar water pumps for 5HP and 7.5 HP capacity AC and DC centrifugal submersible with manual tracking facility. The desired specifications are provided below

| Component | Technical details |
|-------------------|---|
| PV MODULES | Solar PV modules must conform to IEC 61215/IS 14286, and IEC 61730 Part 1 & Part 2 standards. The module manufacturer should be ISO 9001:2000 & ISO 14001. |

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| | <p>Crystalline Silicon modules with efficiency higher than or equal to 14 % and fill factor of minimum 70% to be used.</p> <p>PV Modules 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.</p> <p>As per the JNNSM guidelines, for the 5 HP pump the PV array capacity should range around 5000 watts peak, measured under Standard Test Conditions (STC). The power output of individual PV modules used in the PV array, under STC, should be a minimum of 74 Watts peak, with adequate provision for measurement tolerances. Use of PV modules with higher power output is preferred.</p> <p>The capacity of the solar panels provided for running higher capacity of solar pumps beyond 5 HP should be clearly mentioned in the budget.</p> <p>We would require solar panels manufactured in India by the bidders.</p> |
| Pump | <p>AC/ DC submersible centrifugal pump of 5HP and 7.5HP .</p> <p>The pump should lift water from a suction head ranging between 7.0 meters to 10 metres. The pump should be suitable to cultivate a catchment area of 10-12 hectors.</p> <p>The pump should be provided with mechanical seals which ensure zero leakage.</p> |
| Mounting Arrangement | <p>Manual tracking facility with seasonal tilt adjustment is necessary. Ideally we would prefer sGalvanized carbon steel as the material of construction.</p> |
| Additional features | <p>Any systems that can be used to improve the functionality of the Solar Pumps should be provided separately.</p> <p>Suitable inverters may be suggested for AC motor pump sets.</p> |

The solar water pumps will replace the existing diesel based pumps and hence there will be no need or expenses for boring. The other infrastructure costs (eg room for setting the pump and channels for water flow will be developed through the project).

Services expected from the Company within the project

- Warranty of the technology for at least three years post installation of the pump with an assurance of after sales service.
- The company should provide capacity building of the local villagers regarding the operation of the water pumps after installation of the pumps.