**Solar Electric Technician (Level 2)**

**Module 4: Site selection for solar PV systems**

**E6: Assignment - Solar water pump site assessment and installation requirements**

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| **E6: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Site assessment and installation requirement for solar water pumps. |
| **What** | Perform and analyse the site assessment for installation of solar water pumps. |
| **Why** | To enable participants to understand and identify the key factors involved in installing a solar water pump, including reading the specifications, safety precautions, and installation process. |
| **How** | 1. Group of 2 or 4. 2. Study the solar water pump manual. 3. Assess the site for solar water pump installation suitability and requirements. 4. Answer the questions and discuss the results. |
| **Time** | 60’ for each technology (at least two) |

**Verify the report, manuals, drawings and documentation to assess, plan and install solar water pump.**

**Required tools/equipment:**

* Manual
* Compass
* Measuring tape
* Camera (smartphone) for documentation

| **Specific tasks/instructions** | **Findings/Observations/Verifications** |
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| 1. Read the manual and identify the following key details:  * Pump capacity (flow rate, pressure, and head). * Voltage and current rating of the motor and control system. * Pump type (submersible or surface). * Required solar array capacity and compatibility with the pump. |  |
| 1. Read, comprehend and discuss the safety measures required during the installation of the solar water pump, such as:  * Electrical safety: Avoid working on live circuits, proper grounding, and use of appropriate wire sizes. * Mechanical safety: Proper handling of the pump to prevent damage or injury. * Use of Personal Protective Equipment (PPE), such as gloves and safety boots, while handling the pump and electrical components. |  |
| 1. Review the mounting or installation guidelines for the solar panels powering the water pump and the pump itself. |  |
| 1. Discuss the following:  * Solar panel tilt angle and orientation to ensure optimal sunlight exposure. * Securing the pump: Ensure the pump is firmly mounted to avoid displacement or vibrations. * Mounting height: If it's a surface pump, verify its positioning in relation to the water source. |  |
| 1. Review and note down the pump’s operating voltage and current range. |  |
| 1. Identify the temperature limits for both the pump and the solar panel system. |  |
| 1. Discuss the pump's duty cycle (how long it can run continuously) and how external factors like temperature and water quality may affect performance. |  |
| 1. Discuss the step-by-step process for installing the solar water pump, including:  * Assembling the solar array. * Connecting the solar array to the pump controller. * Installing the pump in the water source (submersible or surface). * Connecting the pump to the controller and power source |  |
| 1. Review the pump’s wiring requirements: |  |
| 1. Wire size suitable for the current rating. |  |
| 1. Proper routing of cables to avoid damage. |  |
| 1. Discuss the regular maintenance requirements of the solar water pump system and provisions at the site |  |
| 1. List the necessary tools for installation. |  |
| 1. Identify the tools required for the installation |  |
| 1. Inspect the site to ensure the water source is reliable and capable of providing enough water for the pump. |  |
| 1. Discuss the importance of verifying water recharge rates to ensure the source is sustainable for long-term operation. |  |
| 1. If applicable, review any site-specific challenges like fluctuating water levels or sedimentation. |  |
| 1. Visit a site where a solar water pump is to be installed and perform a pre-installation checklist to verify the suitability of the site for the solar panels and pump. |  |
| 1. Practice wiring and assembling the pump components. |  |
| 1. After the exercise, record and present the findings and share insights on the specific requirements and challenges identified. |  |
| 1. Discuss any unique site conditions or installation challenges and how you would address them. |  |