

SUPPLY AND DELIVERY OF 2 x SOLAR POWER TRAILERS (FOR BOREHOLE IRRIGATION)

TECHNICAL SPECIFICATIONS

The ARC NRE seeks to acquire two mobile solar power trailers designed for swift on-site setup and easy mobility across any farming environment. Featuring an integrated submersible pump and water pipe, these trailers offer an ideal solution for efficient livestock watering and irrigation.

Technical specifications

- Must be a 2-axle trailer with 15-inch wheels and brakes
- Gross Vehicle Mass between 750kg and 3500kg
- Built-in robust steel frames and supports, mounted with **monocrystalline 330W** x 4 solar **modules (Module dimension: 1640 x 992 x 35mm)** or equivalent but not less than **1320W** peak
- A total trailer length of 4.5m to fit 4 solar modules. A trailer length of 4.5m is inclusive of the drawbar length (e.g. A drawbar should be fitted within a total trailer length of 4.5m)
- Solar modules are to be tilted at the optimum tilt angle for absorption of solar radiation. Orient the panels at an angle of **25 to 35 degrees** as this inclination will ensure that the panels receive optimal sunlight, maximising energy production.
- The trailer must be equipped with a **750W** submersible pump, powered from a **330W** x 4 solar modules
- **60 m** submersible power supply wire, for connecting the pump to the solar system/solar pump controller
- The trailer must be equipped with an HDPE Pipe, 100m roll, 32mm (Pipe diameter) for connecting to the pump. Pressure rating of the pipe: Class12(1200KPA/12bar)
- The trailer must have a built-in mechanism for rolling the pipe for travel mode. Travel includes moving from trailer storage building to different borehole sites for water pumping.
- The trailer must be painted. All steel frames must be painted black.
- Instruction/Operation manual and a short training on how to operate a solar trailer (This training can be conducted within an hour of delivery or scheduled before or after delivery)

Please see below for more details

Solar/pump system	Value/Comment
Pump size	4" (100mm)
Pump size in Watts	750W
Max flow rate	4.0 m ³ /h or 4000 litre/hour
Max head	103m
Outlet pipe	32mm (1.25 inch)
Required panels	330W x 4 solar modules
MPPT Controller/Solar pump controller	Please ensure the correct panel configuration before connecting the pump controller. Input Voltage to the MPPT controller/ Solar pump controller is not to be exceeded.

Surge protectors	Include surge protectors to protect electronic equipment from unwanted power surges or "spikes"
IP67 Rating enclosure	IP67 Enclosure should be installed on the trailer to protect electrical components (solar pump controller, surge protectors, etc.) against water and dust
Low level sensor	The pump must be protected against lack of water in the borehole. This level sensor can either be a separate probe or integrated into the supply cable

The solar trailer must be designed for effortless operation, eliminating the need for professional electrician skills to energise the pump. The submersible pump must seamlessly connect to the solar system, ensuring a user-friendly setup that anyone can manage with ease.

The solar trailer in figure 1 serves only as a guideline to give a general idea of the solar trailer. The service provider must use innovative approaches in designing a robust solar trailer as per the specifications above. The trailer must be able to withstand rough terrain on a daily basis as it will be towed to several boreholes in a farm.



Fig.1: Mobile solar power system with 4 panels, single axle, submersible pump, and water pipe.

All electrical work must be performed by a qualified electrician with a wireman license (Proof of qualification to be provided with proposal) and must be registered with the Department of Labour.

All electrical components (surge protection cabinet, solar pump controller cabinet with IP 67 rating, solar panels, etc) must be installed on to the trailer. A provision for rolling the HDPE pipe must be built into the trailer, and the pipe must be in a rolled position when the solar trailer is delivered. The solar system must be ready for a quick coupling to the pump. All electrical wiring must be secure and protected against heat and water as per the applicable electrical regulations and codes of practice.

Warranty

All equipment (solar panels) installed must have a manufacturer's warranty. The service provider shall provide a 12-month guarantee on the workmanship of the work undertaken at no cost to the ARC. If during this period the equipment is not in good working order, or not working satisfactorily owing to faulty material, design, or workmanship, the service provider will be notified and immediate steps must be taken by the service provider to rectify the defects and/or replace the affected parts on-site, at no cost to ARC.

The installation must comply with all warranty claim processes specific to the brand of equipment. The service provider must hand over all documents related to warranty certificates, including data sheets for all equipment.

Experience

Qualified service providers are required, but more than that, experience is required. Service providers must provide a list of recently completed projects with similar size specifications , traceable contact details, and at least **2** reference letters.

Construction Industry Development Body

CIDB Grading 1EP or above.

Datasheet and images of all equipment must be provided.

Compulsory requirements

- **Date: 10 March 2025 @ 11:00**
- **Date: 18 March 2025 @ 08:00**
Address: Agricultural Research Council
Agricultural Engineering
141 Cresswell Road
Weavind Park

