Supply, delivery and Installation of a 12 kWp Grid-Tied Solar PV System with 60kWh Lithium-ion batteries at Seotlong Agri and Hotel School.

TECHNICAL SPECIFICATIONS

Supply, delivery and Installation of a 12 kWp Grid-Tied Solar PV System with 60kWh Lithium-ion batteries at Seotlong Agri and Hotel School.

Specifications Item	Specifications Details

Solar modules and Hybrid Inverters	• Supply and install 500Watt Monocrystalline solar PV modules x 24, to yield a maximum power output of 12-kilowatt Peak(kW_p).
	• The solar modules will be mounted on the current roofing.
	• Solar modules: Jinko Solar, Canadian Solar, JA solar, RenewSys, Trinasolar , SunPro, Risen ,Haitai Solar, Astroenergy or **Equivalent**
	• Solar PV modules must comply with the SANS/ IEC standards. Compliance of solar modules to the following standards is mandatory:
	  ○ ISO9001:2015: Quality Management System
	  ○ ISO14001:2015: Environment Management System

	○ ISO45001:2018: Occupational health and safety management systems • Supply and install a Sunsynk 12kW hybrid inverter to match a 12kWp Array. • The inverter must be listed on the approved Photovoltaic (PV) Inverter List to ensure compliance in terms of NRS 097-2-1. For reference on this list, please **google** Approved Photovoltaic (PV) Inverter List • Supply Install all necessary Surge Protection Devices, including the one for the **Lightning Protection** • Supply and install all necessary Distribution Boards for all the lighting loads • Supply and install all necessary wiring for the solar PV System
Batteries	• Supply and install a lithium-ion battery of 60 kWh. Individual Batteries can be connected to make a total of 60kWh, for example, 15kW x 4 = 60kWh, **Brand: Sunsynk or Equivalent** • The type of batteries selected must allow parallel connection for scalability of energy storage. • Dischargeable at 80% Depth of Discharge (DoD). • Performance cycle life ≥6000 cycles. • Safe and secure with thermal management features. • Battery management system. • Installation Type: **Floor Stand or Wall Mounted** (To be finalized with end-user).

	• Supply battery rack/cabinet for support of batteries, where applicable. • Ensure the battery model is compatible with the inverter

Lightning Protection and Earthing for Solar PV

Apply measures to prevent catastrophic damages and failures of the installed PV system due to lightning. South Africa is in a highly lightning-dense region when compared to the rest of the world. Therefore, lightning strikes can still pose a risk to any electrical system, including solar panels, **installing lightning protection specific to the installed solar PV system.** Proper grounding, surge protection, and adherence to safety guidelines are crucial to minimizing the potential damage caused by lightning strikes. Grounding involves connecting solar panels, inverters, and other electrical components to the Earth's surface, creating a path for electrical currents to safely dissipate into the ground. **Use earthing, electrical configurations, and protection products based on standard compliance and protection**.

Application for management

The solar PV system must include a user-friendly mobile and desktop application for monitoring and managing system performance. This app should provide real-time data on energy generation, battery status, and grid interaction, allowing users to track energy usage, savings, and system health. It should feature intuitive dashboards, alert notifications for system faults, and customizable settings to optimize energy consumption. The app must be compatible with Android, iOS, and web platforms, and allow remote access to ensure easy monitoring and control of the system, enhancing user engagement and system management efficiency.

The system provider must offer comprehensive training on how to effectively use mobile and desktop applications for monitoring and managing the solar PV system. This training should cover all key functionalities, including tracking energy generation, battery performance, and system health, as well as setting alerts and optimizing energy usage. Additionally, the provider should offer ongoing support for at least 12 months post-installation, ensuring users have access to assistance in case of any technical issues or questions regarding the app or system operation. This support will help ensure smooth adoption and optimal use of the system.

Commissioning

- Installation must have been performed under the supervision of a qualified electrician according to the approved design, signed off-by professional electrical engineer.
- The qualified installer/electrician/company must be a registered electrical contractor.
- The electrician must sign a certificate of compliance (COC) for the installation.
- As part of a hand over, system design, as-built drawings, line diagram, Operation and Maintenance manual, Municipal/NERSA/Eskom Approval letter and warranty certificates must be submitted to ARC.

Warranty

All equipment (Inverters, solar modules, batteries, etc) 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.

Inverters and batteries must be installed by a qualified electrical wireman (Proof of qualification to be provided with proposal) with a valid registration with the Department of Labour. A valid electrical certificate of compliance must be issued once installed, specific to the installation of the backup solar system. The installation must be compliant with SANS 10142 and all its parts. The installation must comply with all warranty claim processes specific to each brand of equipment. The service provider must hand over all documents related to warranties.

Warranties Periods:

- Inverters 5-Year warranty
- Solar modules: 12 Year product warranty and 25 Years linear power performance Warranty
- Batteries 10-year warranty

ARC and the appointed Contractor/Service Provider.

Compulsory Requirements

Table 1 Compulsory Requirements

1. Compulsory **Site Briefing**
2. **CIDB** Grading 2 EP or above.
• **Data sheets** for solar modules/panels must be submitted together with all the bidding documents. Solar modules must comply with SANS/IEC standards as stipulated in the specifications, please see details of specific standards required under “Product Compliance” section of the technical specifications document. Note: Data sheets must be official documents (In PDF format) from the product manufacturer Data sheets that are copied from the internet and paste into word, then back to PDF will not be allowed. Bidders must submit official **manufacturer data sheets (PDF format)** for all major system components, including: • **Solar Modules:** 500W Monocrystalline modules × 24, yielding a **12 kWp grid-tied system**, mounted on the existing roof. • **Hybrid Inverter:** 12 kW hybrid inverter compatible with the 12 kWp array. • **Batteries:** Lithium-ion storage totalling **60 kWh**, compatible with the inverter and capable of parallel connection for scalability.
Qualified service providers are required to demonstrate experience by submitting **three (3) reference letters** for completed projects of similar size and scope, consisting of grid-tied systems with a minimum capacity of 5kW. Each reference letter must include the project description, capacity, client organization, traceable contact details, and completion date. Failure to provide all three reference letters will result in disqualification.