**RFQ\_Section\_lll\_part 2:**

**Technical Specifications Questionnaire to be filled by the bidder**

**LOT 1 Supply and Installation of Solar Power Systems for Water Wells in Matnah , Sana’a City**

**( EHC-AF-WS-SAN-008-2 )**

**FOR AlSANAFEAH**

**Technical specifications for goods – Comparative Data Table.**

| **No.** | **Item Description** | **Is quotation compliant?**  **Bidder to complete** | **Bidder’s Offer**  **specifications** |
| --- | --- | --- | --- |
| **1** | **Solar PV Module** |  |  |
| 1.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 1.2 | Model | Bidder to insert details | Bidder to insert details |
| 1.3 | -The capacity of the solar modules should be at least 40 % greater than AC motor pump.  -Module capacity should not be less than 650 W @STC  -The solar modules should be designed to run near the MPPT  -Type of cell: Mono Crystalline, 5 busbar technology  -The PV manufacturer should be approved as tier-1.  -Module efficiency: should not be less than 20.9%  -Positive Tolerance of maximum power rating  -The PV modules junction box must be IP67  -Should be supplied from approved tier 1 manufactures only.  -Module Voltage: Not less than 1500 VDC;  -Operating temperature: -40°C to 85°C  -Temperature Characteristics: P max: -0.42% /C° or less  -VOC: -0.31% /C° or less;  -Nominal operating cell temperature (NOCT) : 43 ±2°C.;  -Weather proof DC rated MC4 connector. Fully Secured, not allowing for any loose connections.  -High transmittance tempered glass: Min.thickness of 4.0 mm;  -Must conform to IEC 61215, 61730, 61701, and UL 1703.TUV, UL certificates or equivalent;  -Certificates and Data sheet of PV module that contains the P-V & I-V Curves, all electrical and mechanical Data, Dimensions, Module area should provide by bidder;  -Performance warranty: Nominal power output 90% for 10 years, 80% for 25 years;  -Product warranty shall be at least 10 years. | ☐ Yes ☐ No | Bidder to insert details |
| **2** | **DC Combiner Box (DCCB)** |  |  |
| 2.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 2.2 | Model | Bidder to insert details | Bidder to insert details |
| 2.3 | - Enclosure materials: Coated metal with lockable door.  - Enclosure protection: IP65.  - Number of input circuit: total number of strings in addition to 2 spare inputs.  - DC fuse rating for each string:1000V, 30 A.  - DC output circuit: In accordance with the maximum current X 1.25, 1000 VDC breaker;  - Built in surge protection device;  - Anti-backflow diodes.  - Operational Environment Temperature: -30 °C ~+70 °C;  - Product warranty shall be at least 2 years. | ☐ Yes ☐ No | Bidder to insert details |
| **3** | **Solar pump inverter** |  |  |
| 3.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 3.2 | Model | Bidder to insert details | Bidder to insert details |
| 3.3 | Capacity (KW): not less than 75 KW. | ☐ Yes ☐ No | Bidder to insert details |
| 3.4 | •Three phase output, voltage range 380-420 V;  •Efficiency: Not less than 95%;  •Output Frequency: 50H±3%;  •Enclosure class should be not less than IP55.  •Maximum input voltage Voc): not less than 850 VDC;  •The system should be designed to run near its MPPT range;  •Operating temperature: up to 45 °C;  •Such device should have built in data loggers  •The device shall allow hybrid operation with external power source, where solar power should be configured as the primary power source;  soft start, V/F stable speed control during solar radiation changes, adjustable auto/ manual start in early morning, auto wakeup after adjustable hibernation time in cloudy days, o inputs for pressure switch and water level sensor to protect the pump against dry running and tank full water or closed pipeline (high pressure)  •Display: LCD Screen display with Cover + LED status indicator.  •Protection: Over-Voltage, pump Over-Current, pump Over-Load, Over-Temperature, pump Phase Loss, pump Short-Circuit, ground fault, solar low power, DC Input Anti-reverse, AC output unbalance (3Phase);  •Display content: PV status (Current, Voltage, Power, Energy), AC input voltage, AC output voltage, Load, Running Status, RPM, and Frequency.  Product warranty should be at least 2 years. | ☐ Yes ☐ No | Bidder to insert details |
| 4 | **DIESEL GENERATOR** |  |  |
| 4.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 4.2 | Model | Bidder to insert details | Bidder to insert details |
| 4.3 | (150-180) KVA capacity . |  |  |
| 4.4 | - 3 phase,4Wire, 380-415 V, 50 Hz, 1500 RPM.  - Diesel engine complete with its accessories.  - Alternator, self-excited.  - Steel base-plate complete with anti vibrators, bolts and nuts.  - Automatic Voltage Regulator ( AVR ).  - Control, instrument, meters and indicators panel board  - Speed governor.  - Water cooling system.  - Inlet air system.  - Exhaust system. | ☐ Yes ☐ No | Bidder to insert details |
| **5** | **Electrical Submersible Pump** |  |  |
| 5.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 5.2 | Model | Bidder to insert details | Bidder to insert details |
|  | -Rated capacity: 36 m3/hr @ Head of 298m  - Mixed flow multi -stage separate type, AC 3PH motor type; - Pump diameter: 6 inches  - Power supply: Three-phase, 380 volts, 50 Hz - Motor: Centrifugal, wet-rotor, induction motor - Impellers: Stainless steel, multi-stage - Shaft: Stainless steel | ☐ Yes ☐ No | Bidder to insert details |
| 6 | **DC Solar PV Cable** |  |  |
| 6.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 6.2 | Model | Bidder to insert details | Bidder to insert details |
| 6.3 | • Cable type: Solar PV cable • Size: **1×10 mm²** from array to combiner box • Size: **1×120 mm²** from combiner box to inverter  • Length: As per drawings  • Insulation: Polyethylene • Jacket: PVC • UV resistant • Flame retardant • The cable must be installed in accordance with the technical specifications and drawings. • The cable must be tested for continuity and insulation resistance. • The cable must be commissioned by a qualified electrician. | ☐ Yes ☐ No | Bidder to insert details |
| **7** | **AC Power Cable** |  |  |
| 7.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 7.2 | Model | Bidder to insert details | Bidder to insert details |
| 7.3 | AC submersible power cable with the following specifications: • Cable type: CU/XLPE/PVC  • Size: 4x (1 Core × 95 mm²) • Number of cores: 3 • Conductor per phase: 1 • Insulation: Cross-linked polyethylene (XLPE). • Jacket: PVC. • UV resistant. • Flame retardant. • Voltage rating: 450/750 VAC. • Type of conductor: Copper, flexible, finely multi stranded. • Insulation: Black polychloroprene, HO7RN-F or equivalent material. | ☐ Yes ☐ No | Bidder to insert details |
| **8** | **Level Sensor Cable** |  |  |
| 8.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 8.2 | Model | Bidder to insert details | Bidder to insert details |
| 8.3 | Level Sensor Cable with probes with the following specifications: • Cable type: Level Sensor Cable • Size: 3 x 1.5 mm² • Number of probes: 3 • Probe material: Stainless steel • Probe insulation: Polyurethane • Cable jacket: PVC • UV resistant • Flame retardant | ☐ Yes ☐ No | Bidder to insert details |
| **9** | **Circuit Breaker MCCB** |  |  |
| 9.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 9.2 | Model | Bidder to insert details | Bidder to insert details |
| 9.3 | -NEMA 3R enclosure  - powder-coated steel construction include 200A, 400V, 3P & 25KA Molded Case Circuit Breaker (MCCB) |  |  |
| **10** | **Fuel Tank** |  |  |
| 10.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 10.2 | Model | Bidder to insert details | Bidder to insert details |
| 10.3 | -A complete elevated outdoor daily Steel Fuel tank with a capacity of 5000 L and a thickness not less than 5 mm, including a Sight Glass Level Measurement (Gauge) and all necessary fuel pipes, fittings, valves, filters, flow meter up to 4 ℓ/sec, suitable for diesel service, instruments and all accessories for connection to the genset base fuel tank. The tank must be applied with two layers of epoxy outside and three layers inside. | ☐ Yes ☐ No | Bidder to insert details |
| **11** | **Earthing System** |  |  |
| 11.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 11.2 | Model | Bidder to insert details | Bidder to insert details |
| 11.3 | • 2 x Copper rods, tap-clamps, earthing pits (Y/G earthing cable, earthing pits and all system accessories). • 3 x Earth bus bars. • Main earth cables (Bare cables between earth rods, earthing bars and its interconnections) should not be less than 70mm2 bare copper. • The sizing of earthing conductor and earthing installation shall be according to IEE Wiring regulations & BS 7671. • Earth resistance should be tested in presence of the UNOPS representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. • All conductive materials shall be copper. | ☐ Yes ☐ No | Bidder to insert details |
| **12** | **Lightning System** |  |  |
| 12.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 12.2 | Model | Bidder to insert details | Bidder to insert details |
| 12.3 | • Lightning arrester: Copper • Lightning arrester height: As per drawings • Lightning arrester compliance: IEC/BS EN 62305-3 • System resistance: Not more than 1 ohm • Earthing installation: In accordance with the IEE Wiring regulations, BS 7671 • All conductive materials: Copper • Conductor size: According to table 54.7 of IEE – BS 7671 – IEC 60365-5-54 | ☐ Yes ☐ No | Bidder to insert details |
| **13** | **Fire alarm System** |  |  |
| 13.a | **Smoke detectors** |  |  |
| 13.a.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 13.a.2 | Model | Bidder to insert details | Bidder to insert details |
| 13.a.3 | -Standalone smoke detectors. -Must be photoelectric or ionization type  -Must have a sensitivity level of at least 5%  obscuration -Must have a battery backup -Must be labeled in a clear and concise manner | ☐ Yes ☐ No | Bidder to insert details |
| 13.b | **Heat detectors:** |  |  |
| 13.b.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 13.b.2 | Model | Bidder to insert details | Bidder to insert details |
| 13.b.3 | -Must have a heat detection range of at least 50°F to 150°F - Must have a battery backup - Must be labeled in a clear and concise manner | ☐ Yes ☐ No | Bidder to insert details |
| 13.c | **Flame detectors:** |  |  |
| 13.c.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 13.c.2 | Model | Bidder to insert details | Bidder to insert details |
| 13.c.3 | - Operating voltage: 24 VDC nominal (18-32 VDC) - regulated  - Detects hydrocarbon and non-hydrocarbon fuel fires in all environmental conditions  - Alarm Current ≤ 32 mA |  |  |
| 13.d | **Fire CO2 Extinguishers** |  |  |
| 13.d.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 13.d.2 | Model | Bidder to insert details | Bidder to insert details |
| 13.d.3 | • Must be 5KG CO2 type • Must be approved to BS EN 3 Parts 7 to 9 and SS EN3 &UL standards • Must have a discharge time of at least 10 seconds • Must be labeled in a clear and concise manner Accessories: • Must include a carrying case • Must include a hose • Must include a nozzle | ☐ Yes ☐ No | Bidder to insert details |
| 13.e | **Powder Extinguishers** |  |  |
| 13.e.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 13.e.2 | Model | Bidder to insert details | Bidder to insert details |
| 13.e.3 | • Must be 6 kg powder type • Must be approved to BS EN 3 Parts 7 to 9 and SS EN3 &UL standards • Must have a discharge time of at least 10 seconds • Must be labeled in a clear and concise manner Accessories: • Must include a carrying case • Must include a hose • Must include a nozzle | ☐ Yes ☐ No | Bidder to insert details |
| **14** | **Lighting** |  |  |
| 14.a | **LED Lighting** |  |  |
| 14.a.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 14.a.2 | Model | Bidder to insert details | Bidder to insert details |
| 14.a.3 | • Must be LED type • Must be dimmable • Must have a lifespan of at least 50,000 hours • Must be labeled in a clear and concise manner **Accessories:** • Must include a power supply • Must include a mounting bracket • Must include a controller | ☐ Yes ☐ No | Bidder to insert details |
| **14.b** | **Solar LED Street Light** |  |  |
| 14.b.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 14.b.2 | Model | Bidder to insert details | Bidder to insert details |
| 14.b.3 | LED: • Maximum output: 40W • Efficacy: At least 120lm PV module: • At least 60Wp Battery: • Type: LiFePO4 • Voltage: 12.8V • Capacity: At least 27 AH Mounting system: • For fence poles | ☐ Yes ☐ No | Bidder to insert details |
| **15** | **Mobile, Unheated High-Pressure Clean** |  |  |
| 15.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 15.2 | Model | Bidder to insert details | Bidder to insert details |
| 15.3 | A mobile, cold water high-pressure cleaner such as Kärcher HD 10/23-4 S with the following specifications: • Working pressure = min 200 Bar • Motor = 4-pole, three-phase motor with air and water cooling Price shall include providing all required solar panel cleaning equipment, include brushes such as Kärcher iSolar 800 water-driven brush head or equivalent, sprayers, chemical cleaners such as RM 99 Solar Cleaner or equivalent and extender poles as well. | ☐ Yes ☐ No | Bidder to insert details |

The offered goods and related services (if applicable) are in accordance with the required specifications and requirements specified in **RFQ\_Section\_ll\_Technical Requirements\_** **Scope of work and Technical Specification \_ BoQ Part one above**.

☐ Yes ☐ No

ANY DEVIATION MUST BE LISTED BELOW:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_