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

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

**LOT 2 Supply and Installation of Solar Power Systems for Water Wells in Matnah , Sana’a City**

**( EHC-AF-WS-SAN-008-02**

**For TANK LOCATION**

**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 45 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 | (105-120) KVA capacity . |  |  |
| 4.4 | Sound-Proof Prime Power Diesel Generator -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 inline surface multistage Pump Unit (Pump and Motor).** |  |  |
| 5.1 | Manufacturer / Assembler/ Origin | Bidder to insert details | Bidder to insert details |
| 5.2 | Model | Bidder to insert details | Bidder to insert details |
| 5.3 | -Rated capacity: 60 m3/hr @ Head of 110m  - 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: **1×95 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 × 35 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) | ☐ Yes ☐ No | Bidder to insert details |
| **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  - 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 | ☐ Yes ☐ No | Bidder to insert details |
| 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:

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