

## **Annex A**

### **Technical Specifications**

**REQUEST FOR QUOTATION: No. UKRKI / RFQ / 2022-148**

### **FOR THE SUPPLY OF GENERATORS**

Engine Brand: Caterpillar, Perkins or Equivalent

The request includes the supply of complete enclosed diesel generators of various capacities (See Below) tools, controls and all accessories as outlined in this specification. The diesel generator sets are foreseen to operate on isolated mini grids either alone, in modular combination with other diesel gen sets or in hybrid set-up with gen sets using renewable energy sources (e.g. PV & battery modules). They could also be used as back up supply for grid-connected systems.

Each Generator shall be supplied complete with the following items:

- Supply of all installation drawings and documentation, Operation and Maintenance manuals.
- Design, supply and warranty of:
  - a. Enclosed diesel generator sets with the given minimum kVA rating Prime rated at 240/415V, 1500/1800 rpm, comprising a diesel fuelled, reciprocating, inter-cooled, prime power rated engine which is direct coupled to a three phase 400 V synchronous generator;
  - b. The gen set shall be able to provide prime power on variable loads for an unlimited number of hours per year, in island operation mode, providing 110% of prime power during minimum of 1 hour per 12 hours cycle;
  - c. Completely enclosed diesel generators fully suitable for the given environment complete with sufficient space for all engine fluids, base fuel tank, noise abatement, water-air radiator, exhaust systems and all necessary controls, remote monitoring and ancillary components;
  - d. General access and protection structures;
  - e. Diesel generator earthing system;
  - f. Synchronization unit for load sharing across multiple interconnected generators (kW, kVAr),
  - g. Diesel generator control system and enhanced power management;
  - h. Fuels transfer system inclusive manual fuel transfer system from external tanks;
- Factory Acceptance Testing (FAT) complete with all documentation, certificates, test reports;
- Remedy all defects.

- Provision of training for Operations and Maintenance staff.
  - Provision of Operation and Maintenance manuals
  - Provision of spare parts, and special tools.
  - Provision of all signed certification (HSNO, Electrical Certification etc.) for the plant supplied.
  - Warranty during the warranty period.
- **Specifications for 10 kVA generators:**
- Phase: 1-Phase (Single Phase)
  - Starting System: Electric
  - Fuel Tank Capacity: More than 25L
  - Fuel Type: Diesel
  - Cooling system: Air Cooled
  - Noise rating: less than 70db
  - With Automatic Voltage Regulator
  - With wheels for easy transport

The supplier shall provide generator sets with the following prime-rated output capacities below,

- A. 10 kVA – 10 units
- B. 16kVA – 2 units
- C. 30 kVA – 3 units
- D. 45 kVA -2 units
- E. 60kVA – 2 units

**All to be Three phase generators and should include exhaust pipes with bends.**

The supplier shall also provide for the synchronization control system which could be provided with each generator.

The supplier shall provide options for manual switchover control panel, automatic switchover control panel for single machine control, and also, panels for full synchronization control.

The Supplier shall state and guarantee:

- Fuel usage rates at 110%, 100%. 75% and 50% prime rated output (g/kWe) and corrected values as noted.
- Maximum net output (kWe) of each diesel generator.
- Continuous net output (kWe) of each diesel generator.

The diesel engine, alternator, generator control panel, fuel delivery system and fuel storage system shall comply with the current versions of the applicable standards or equivalent standards.