## **Appendix 9: Scenario-Based Requirements for the Design and Costing of the Solar PV System**

## **(intended for Evaluation Purpose)**

In addition to the Technical Proposal and Appendix 5 (Price Schedules), for the purpose of evaluation, **Bidders are requested to also provide approach/ draft design and price proposal (Appendix 10) for specific project as outlined below.** The approach/ draft design shall be submitted together with the Technical Proposal while the Appendix 10 (Price Proposal) shall be submitted together with the Appendix 5 (Price Schedules).

The Unit Rate used in the Appendix 10 (Price Proposal) should be the same with the Unit Rate stated in the proposed fixed rate in Appendix 5 (Price Schedules). The table formats shown in Appendix 10 (Scenario-Based Price Proposal) are suggested for use as a guide in preparing the financial proposal for the corresponding project(s).

**1. Background**

A UNICEF administrative office has decided to install a solar PV system on their main office building roof and car park areas; therefore it is seeking a service provider for the design, supply, installation, testing, commissioning, and servicing of the anticipated solar PV system.

Bidders are requested to submit proposals for two different financial modalities:

1. **Option 1:** Capital Expense (CAPEX) Model;
2. **Option 2:** Leasing agreement for the Solar PV System (all inclusive) for an agreed period.

The location of the facility is described in Table A9.1, the operating conditions are described in Table A9.2.

**Table A9.1: Geographical Location / Project no. 1**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Data** | **Description** | |
| **1** | **Country** | **Nepal** | |
| **2** | **City** | **Kathmandu** | |
| **3** | Coordinates | Longitude: 85.324000 | Latitude: 27.717200 |
| **4** | Area Rooftop | Main Building no.1 | 200 sq.mtr |
| **5** | Area Parking |  | 1200 sq.mtr |

**Table A9.2: System Operating Conditions**

|  |  |  |
| --- | --- | --- |
| **No.** | **Data** | **Description** |
| **1** | Maximum ambient temperature | 45°C |
| **2** | Minimum ambient temperature | °C |
| **3** | Maximum relative humidity | 95% |
| **4** | Maximum winds | 200 km/h |
| **5** | Environmental condition | Humid tropical climate |

**Table A9.3: Electrical Operating Power Grid Conditions**

|  |  |  |
| --- | --- | --- |
| **No.** | **Data** | **Description** |
| **1** | Voltage | 220 / 380 |
| **2** | Phases | 3 |
| **3** | Frequency | 50 |
| **4** | Feeder | yes |
| **5** | Switchgear | yes |
| **6** | Single Line Diagram | N/A |
| **7** | Distance from rooftop to power connection point in meters | 80 mtr |
| **8** | Distance from carpark to power connection point in meters | 100 mtr |
| **9** | Power Distribution Transformer |  |
| **9.1** | Capacity in kVA | 500kva |
| **9.2** | Type | Oil immersed / ONAN |

**2. Scope of Work**

Scope of work involves design, supply, installation, testing and commissioning of solar PV system for 100% solarization of the UNICEF office. The solar PV system is planned to replace the existing grid system and will be connected to 2 x 100 kVA diesel generators (gensets).

**Table A9.4: Electrical Data of the Diesel Genset / VOLVO PENTA**

|  |  |  |
| --- | --- | --- |
| **No.** | **Data** | **Description** |
| **1** | Make | ITALY / SWEDEN |
| **2** | Model |  |
| **3** | Phases | 3 |
| **4** | Voltage | 415 |
| **5** | Current | AC |
| **6** | Plate Capacity:  kVA/ kW | 380 / 304 |
| **7** | Derated Capacity:  kVA/ kW | 380 / 304 |
| **8** | Fuel consumption  liter/ kWh generated | 20 - 23 |
| **9** | Fuel consumption  liter/ month |  |
| **10** | Year and service-hours | 200 |

The generators will remain for backup purposes in case of any temporary power outage. The solar PV system shall include a **battery bank of sufficient voltage to provide energy generating at least 15,000 kWh per month.**

**Table A9. 5: Load Curves**

|  |  |  |
| --- | --- | --- |
| **No.** | **Data** | **Description** |
| **1** | **Load Supply curve** | 30-35 KW |
| **2** | **Load Demand curve** | 60-70 KW (solar covering 30 KW) |

**3. Available Area to Install the Solar PV Systems**

The office has available adequate space to mount the solar PV systems on the roof of the existing buildings and on the sheds for vehicles. Shading is a factor that accounts for kWh losses. Therefore, the shading analysis will be responsibility of the bidder.

**4. Capacity of the Solar PV Systems**

The office has available adequate space to mount the solar PV systems on the roof of the existing buildings

**Table A9.6: Solar PV System Capacity**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Location** | **Capacity in kWp-DC** | **Capacity in kW-AC** |
| **1** | **Rooftop / Car Park** |  | 123KWp |
| **2** |  |  |  |

**5. Price Proposal:**

Bidders shall submit Financial Proposal for one or both options as below:

**OPTION-1:** Leasing the Solar PV System (all inclusive) with the provision of maintenance support for a period of 7 years. Leasing options shall consider the all-inclusive cost for design, installation, testing, commission, and the equipment proposed in Option 1 above. Please submit financial proposal in the attached excel sheet (Appendix 10A)

**OPTION-2:** Providing the Solar PV System covering design, supplying materials, installation, testing, commissioning, and maintenance support for the installed system. Please submit financial proposal in the attached excel sheet (Appendix 10B)

**Bidders are requested to submit their Financial Proposal for this specific project using the templates provided under the following appendix and which shall be submitted together with the Appendix 5 (Price Schedules):**

- Appendix 10A: Scenario-Based Price Proposal (applicable for bidders that submit proposal for LOT 1, 3, 5,7, 9, 11,1 3, and 15), and/or

- Appendix 10B: Scenario-Based Price Proposal (applicable for bidders that submit proposal for LOT 2, 4, 6,8 ,10, 12, 14, and 16)

The Bill of Quantities and standard technical specifications proposed for the equipment shall be in line with the TOR and the technical specifications provided in Appendix 7.

**6. Guaranteed Electricity Generation and Carbon savings**

**Bidder should design and propose the solar PV system, including guaranteed monthly and annual power generation as well as estimated carbon emission saved for this specific project and Bidder shall submit it together with the Technical Proposal.**

**Table A9.7: Solar PV System Capacity**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Location** | **Minimum Guaranteed annual Generation in kWh** | **Minimum Guaranteed monthly Generation in kWh** | **Estimated yearly CO2 savings in**  **CO2 tons equivalent** |
| **1** | **Rooftop/Car park** | 59,542 | 214 | 700 g / kWh |
| **2** |  |  |  |  |