**Annex 4 – Goods and services specification**

For the Design, Installation and Maintenance of Solar PV system at the British Council

The supplier shall provide the following goods and services to the British Council as per the requirement and order of the British Council:

British Council requires a hybrid solar PV system that will be integrated with existing NEA electricity supply to provide 24/7 electricity to its training centre and server room which has a maximum demand of 4000 watts. The system should be able to cope with regular demand under normal condition and use grid supply only when weather condition is not favourable. Existing battery bank and inverter is to be utilized while building this system and additional automatic changeover switch is to be installed as required. The system should be able to provide minimum of 11 hrs of backup during power outage. The solar panels are to be installed on the roof of the building. Existing system details and other required information is to be collected during pre site visit before submitting RfP which will be arranged on 30 July 2020 at 11 AM.

**Scope of Work:**

1. Contractor shall provide all labour, materials, tools, equipment's, transportation, insurance, etc. for all work herein specified and or required to complete the project.
2. All work shall be in accordance with Nepal Building Code.
3. All work under this contract shall be guaranteed for a period of 5 year after completion.
4. The contractor shall submit electrical layout diagram and label all installation properly.
5. Completion Certificate-On completion of an electrical installation (or an extension to an installation) a certificate shall be furnished by the contractor, counter-signed by the certified electrical engineer under whose direct supervision the installation was carried out.

**Basic Principles to be followed when Designing a Quality PV System:**

1. Ensure the roof area or other installation site can handle the desired system size.
2. Specify sunlight and weather resistant materials for all outdoor equipment.
3. Locate the panels to minimize shading from foliage, vent pipes, and adjacent structures.
4. Design the system in compliance with all applicable building and electrical codes.
5. Design the system with a minimum of electrical losses due to wiring, fuses, switches, and inverters.
6. Ensure the design meets local utility interconnection requirements.

**General Recommendations:**

The following is a list of general recommendations to help the contractor and installer choose the right materials, equipment, and installation methods that will help ensure that the system will provide many years of reliable service.

* Materials used outdoors should be sunlight/UV resistant
* Materials should be designed to withstand the temperatures to which they are exposed.
* Only high-quality fasteners should be used (stainless steel is preferred).
* All electrical equipment should be listed for the voltage and current ratings necessary for the application.
* PV modules should be warranted for a minimum of 5 years.
* All exposed cables or conduits should be sunlight resistant.
* All required overcurrent protection should be included in the system and should be accessible for maintenance
* All electrical terminations should be fully tightened, secured, and strain relieved as appropriate.
* All mounting equipment should be installed according to manufacturers’ specifications
* All roof penetrations should be sealed with an acceptable sealing method that does not adversely impact the roof
* All cables, conduit, exposed conductors and electrical boxes should be secured and supported according to code requirements.
* PV Array should be free of shade between 9:00 a.m. and 4:30 p.m. This requirement includes even Small obstructions such as vent pipes and chimneys. A small amount of shade can have a disproportionately high impact on system performance.
* The proposed system, accessories and all the installation work should comply with Nepal Building Code.

| **S.N.** | **Item and description** | **Unit** | **Quantity** |
| --- | --- | --- | --- |
| 1 | Design of Solar PV compatible with existing system | LS | 1 |
| 2 | Material and Installation of Solar PV system | LS | 1 |