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WWF for a living planet®

INVITATION FOR PROPOSAL

WWF-Việt Nam would like to invite your submission for a Proposal for the **'Installation of Solar PV to WWF-Vietnam office in Hanoi'** with the following information:

1. **Technical specifications for Solar PV installation**
   - Solar array
   - Inverter SMA (no Battery system)
   - Roof structure
   - Solar System Operation Center
   - Surge protection for the system
   - Accessories, electrical box
   - Transportation
   - Onsite training on operation and maintenance

   (Refer to the attached Annexes for more detailed technical specifications)
2. **Quantity**: **01 set**
3. **Venue for Solar PV installation:**

   WWF-Vietnam office in Hanoi

   Address: No.6, Lane 18 Nguyen Co Thach Street, Nam Tu Liem District, Hanoi
4. **Working schedule**

   To be discussed
5. **Conditions for participating in bidding process:**

- Bidder shall fully meet the conditions and capabilities in above-mentioned equipment items according to the provisions of Vietnamese law;
- Having a representative office in Vietnam and ensuring the fulfillment of after-sales obligations such as the warranty as prescribed by the manufacturer;
- Experiences in cooperating with NGOs in providing equipment to local communities is an advantage;
- The Solar equipment package shall meet the quality, quantity and technical specifications of WWF-Vietnam;

6. **Bidding principle:**

Bidder will be selected based on product quality, technical specification, price, bidder's profile and other conditions, including transportation, installation and warranty conditions provided by bidder.

7. Bidder's Proposal:

Bidder's Proposal shall include:

1. Company's Profile (Business Registration, Company's Profile etc…);
2. Product's brand, technical specifications;
3. Quotation as the form in Appendix 2 (in VND and shall include other related costs: VAT, transportation costs etc…);
4. Term & method of payment (advance payment, if needed);
5. Discount policy, guaranty conditions (if applicable);
6. And other relevant documents (see more in the Annex – Documents to be submitted)

The following contents should be clearly mentioned:

Proposal for "Installation of Solar PV system to WWF-Vietnam office in Hanoi"

Proposal shall be sealed and sent directly or via EMS to below address:

TO: WWF – Vietnam

#6, lane 18 Nguyen Co Thach Street, Nam Tu Lien District, Hanoi

Attn: Ms. Le Thi Thu

Deadline for submission is before 17h30, 28th Feb 2019.

Appendix 1 - Technical Requirement and Detailed Specifications

Instruction to Bidders

1. The vendor has to carry out Design, Supply, Installation, Testing and Commissioning of the Solar PV system at the WWF office in Hanoi.
2. The vendor shall submit a bid for all of the following activities and options:

Approximately 10kwp rooftop, Grid connected Solar system

3. THE CLIENT shall evaluate all the options and activities mentioned above and reserves the right to award the contract for the most feasible and cost effective option and activities.
4. The bid should be inclusive of any civil and electrical works that may be required for the functioning of the system; An estimate of maintenance costs and component replacement costs shall be provided.
5. The vendor shall provide all technical literature, design calculations and drawing considered necessary for the installation, operation and maintenance of the equipment and its related accessories/fittings. These shall include:
   a. Design calculation (including shading) and drawings showing overall dimensions and all other details including sectional view of the equipment.
   b. Bill of quantities (BOQ) of all the materials;
   c. Manual of instructions for the operation, maintenance and repair of equipment and accessories;
   d. Equipment datasheets
   e. Any other relevant technical data necessary for the efficient operation and maintenance of the system etc;
6. The vendor shall engage the client's staff during the installation of the system and provide on the job training on the installation, operation and maintenance of the system;
7. All the elements of the system which fail due to manufacturing defect within the period of guarantee shall be replaced by the tenderer, free of cost;
8. The specification and component provided in the technical specification are minimum requirements and therefore the vendor may propose any other additional component if not covered here, which are essential for the proper functioning of the system;
9. The vendor needs to conform to the technical specifications. However, the vendor may propose/recommend items having higher efficiency without major cost implications;
10. The vendor has to inspect the location for installation of solar PV system prior to submission of the bid;
11. The vendor shall obtain the solar energy subsidies/support (if applicable) from the authorities;
12. All equipment shall be provided with labels or name plates, giving a description of the equipment, together with information regarding the solar PV modules, solar power conditioning unit, inverters, charge controller, control systems, cables, and all accessories and balance of system, etc. Such nameplates or labels are to be of non-corrodible, non-hygroscopic materials with lettering of a contrasting colour.

13. A communication system (eg via the inverters) should enable the client's access to the solar PV system's information and performance over the web.
14. The vendor is responsible for the cleaning of the work and its site during and after completion of the works and for the enforcement of hygiene and security measures (for people and materials) during the works.
15. During the whole duration of works, the contractor shall take reasonable steps to ensure the health and safety of his employees. To this end, he will implement all appropriate arrangements to protect the employees against falls froma height, dust and liquids.
16. The contractor will have to provide an all-risk insurance with third party liability limit.

Technical Specifications

1. Approximatively 10 kWp Solar Grid Tie PV System

The Solar PV project shall be executed on a turnkey basis, which includes design, construction, installation, testing and commission. It is of the responsibility of the contractor to strictly respect the Vietnamese standards. Furthermore, all the materials and equipment supplied under this tender shall conform to the latest editions of the International Electrotechnical Commission (IEC) Specifications or any other international standards. If equipment is not covered by IEC then other national standards are accepted if it confers equal or superior quality and performance than IEC or other international standards. You will find hereafter the main standards this project should comply with:

Field	**International standards**
Low voltage electrical installation	IEC 60 364 Electrical Installations for Buildings
Design of solar PV systems	IEC 60364-7-12 Electrical installations of buildings – Part 7-712: Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems
Surge protection device	IEC 61643-12 Low-voltage surge protection devices – Part 12 : Surge protection devices connected to low-voltage power distribution systems – Selection and application principles
Solar PV modules	IEC 61 215 Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval IEC 61 721 Photovoltaic (PV) module safety qualification – Part 1: Requirements for construction

	Thin Film Terrestrial PV Modules IEC 61646 (latest edition) Concentrator PV Modules & Assemblies IEC 62108 (latest edition)
Solar cables	IEC 60228 Conductors of insulated cables IEC 60332-1 Tests on electric and optical fibre cables under fire conditions (category C2) IEC 61034-2 : Measurement of smoke density of cables burning under defined conditions IEC 60754 Test on gases evolved during combustion of materials from cables (halogen-free) IEC 60216 Electrical insulating materials – Thermal endurance properties IEC 60 811-2-1 Common test methods for insulating and sheathing materials of electric and optical cables Part 2-1: Methods specific to elastomeric compounds – Ozone resistance, hot set and mineral oil immersion tests
Cables in trenches	IEC 60502-1 : Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) – Part 1: Cables for rated voltages of 1 kV ((Um = 1,2 kV) and 3 kV (Um = 3,6 kV)
Hot-dip galvanization and anti-corrosion treatment	ISO 1461 Hot dip galvanized coatings on fabricated iron and steel articles -- Specifications and test methods ISO 12944 : Paints and varnishes -- Corrosion protection of steel structures by protective paint systems
Design calculations standards	EN 1991: (Eurocode 1) Actions on structures EN 1999: (Eurocode 9) Design of aluminium structures EN 1993: (Eurocode 3) Design of steel structures ISO 4354 Wind actions on structures ISO 22111 Bases for design of structures – General requirements

	ISO 13823 General principles on the design of structures for durability
Cable trays	IEC 61 537 Cable management – Cable tray systems and cable ladder systems
Inverters	EN 50530 Overall efficiency of grid connected photovoltaic inverters IEC 61727 Photovoltaic (PV) systems – Characteristics of the utility interface IEC 61000-3 Electromagnetic compatibility (EMC) – IEC 62109 Safety of power converters for use in photovoltaic power systems - Part 1: General requirements - Part 2: Particular requirements for inverters IEC 62116 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters
Switchgear	IEC 60439 Low-voltage switchgear and control gear assemblies IEC 60947 Low-voltage switchgear and control gear

2. Scope of Work

The scope of services provided by the vendor shall include all tasks required for the survey, design, engineering, procuring, constructing, commissioning, training for operation and maintenance, and performance of necessary maintenance of the solar PV system.

The works include but are not limited to the following:

- System design of all the components including calculations and layout drawings
- Manufacture, testing, inspection, packing and forwarding, transportation of all the materials including materials for operation and maintenance of the system up to project site, loading & unloading, storage in safe custody
- Construction, installation, erection, carrying out preliminary tests at site, commissioning and performance testing including all civil works.
- Performance warranty of minimum 5 years for safe operation and maintenance
- Handing over of all the equipment to THE CLIENT
- Any other requirement as mutually agreed between the vendor and THE CLIENT

3. Design/Performance Requirement

- Design all materials, component and claddings to resist wind, suction and uplift loading at any point considering the local weather conditions
- While designing do not consider live loads as the system is not meant for people to walk on it.
- Design in accordance to the minimum design loads for the buildings and other structures with a suitable structure to withstand wind load in Ha Noi and should be earthquake resistance provided on the table for seismic consideration for Viet Nam.
- The bidders are required to furnish the following:
  a) Design calculation sheet (soft and hard copy)
  b) Drawings specifying package envelope along with supplier/manufacturer's data sheets.
  c) Bill of Materials (BoM)
  d) kWh per day/cost of the offered PV System
  e) Technical specifications
  f) Schedule of manufacturing and delivery
  g) Clarifications and exclusions.
  h) Recommended spare parts lists

4. Documents to be submitted
   a) Product Data: Provide manufacturer's documents on products, containing, data sheets, test certificates and installation instructions, and operation manuals after completion (soft & hard copy)
   b) Drawings & Layout: Physical and electrical layout and drawings including details (where applicable) for construction, installation and operation and maintenance (Soft and hard copy)
   c) Design Data: System Design and Structural design calculations with signature of professional engineers (hard & soft copy including excel sheets)
   d) Manufacturer test certificates of products.
   e) Manufacturer's warranties: The vendor/manufacturer's warranty will have to be provided.
   f) (If applicable) documents detailing financial and/or other support received from the authorities

5. Delivery, Storage and Handling
   a) The vendor shall arrange to receive, handle, store materials in conformance with the manufacturers printed instructions until the system commissioned. In case of loss or damage of materials, THE CLIENT shall not be liable until proper handing and taking over of the materials is completed.
   b) The vendor is responsible for his own material, and will take all necessary measures for its surveillance. The Client shall not be responsible for any damage or theft during the construction phase.
   c) Store products/materials under protection cover until the installation's start to avoid any damages to materials/products especially exposure to moisture.

d) Avoid overloading the roof structure by spreading the bundles and crates. While mounting on the rooftop, it is recommended to install panels over major supports such as beams (girders) or trusses for safety.

6. Installation
   a) Civil Works and Site Preparation: implementation and/or technical guidance by vendor or by vendor appointed local/regional representative.
   b) Required electrical works for integration of the PV System and Grid. If applicable, the vendor will be required to apply for and receive interconnection approval from the local Utility for the proposed PV system.
   c) PV array mounting and cabling with weather proof connectors.
   d) Earthing.
   e) Anti-corrosion protection of the material and final coat of painting.
   f) Sealing core-drilling operations, fixtures, seals and fixing devices;
   g) Pre-assembling and wiring: mounting of inverters, controllers and the likes done as much as possible in a factory/lab environment.

7. System Integration (Smart Power Management)
   a) Interconnect with building electrical switchboard- selective for the designed load only.
   b) Integrate all power sources and load into one system.

8. System Configuration

System components/service	**Configuration**
PV modules for a total capacity of ~10 kWp	Efficiency above 16%. The following information of solar PV module and accessories must be provided: · Name of the manufacturer of PV Module · Name of the Manufacturer of Solar cells · Month and year of the manufacture (separately for solar cells and module); Country of origin (separately for solar cells and module) · I-V curve for the module · Peak Wattage, Im, Vm and FF for the module · Unique Serial No and Model No of the module · Date and year of obtaining IEC PV module qualification certificate; Name of the test lab issuing IEC certificate · Other relevant information on traceability of solar cells and module as per ISO 9000 series.

	The validity of the existing Certificates/Reports /procedure shall be for five years. Warranty: PV modules used in solar power plants/ systems must be warranted for a life of minimum 20 years.
Module mounting structure for accommodating above mentioned capacity	· Design for Maximum wind speed in Ha Noi · The fasteners will be "inviolable" or "anti-theft". It will be possible using self-breaking nuts or unconventional screws (for instance hexagonal ball screws). · The lot's contractor will have to confirm the mechanical strength of the whole structure with a design calculation. · Every galvanized steel equipment shall be hot-dip galvanized after manufacture. Any worn galvanized item shall be replaced. All on site cutting must be avoided or kept to an absolute minimum. For all necessary rework, a new paint shall be applied in accordance with the standards in force. Particular attention will be paid to avoiding risks of corrosion, in particular electrolytic attack by certain materials. When submitting its bid, the contractor will provide all technical documentation concerning the materials he will supply, including information on lifespan and UV resistance.
Solar inverter	~ 10 kVA, star 3 phase Warranty: The mechanical structures, electrical works including power conditioners/inverters/ charge controllers/ maximum power point tracker units/distribution boards/digital meters/ switchgear etc. and overall workmanship of the SPV power plants/ systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years.
AC Distribution Box	
System Cables requirement as per design	Copper as per IS standard and design; calculations based on site conditions. Wire losses in DC circuits to be < 1.5%; in AC circuits to be < 1.5%.
Lightning arrester complete set as per specifications	Material: Stainless steel and epoxy resin Radius of Protection, protection level and OPR: calculated based on standards NFC 17-102

Earthing complete set as per specifications	Copper/Hot Dip Galvanized. The complete earthing system should be electrically and mechanically connected to ensure an independent return path through earth. All single/three phase lines provided with proper earth connections and all DC grounding from the array junction boxes grounded separately to an earth.
Spares, tools and plan for 5 years operation & maintenance	As per relevant standard
Fuses, Transfer switches, printed circuit boards required for power plant	As per relevant standard
Training to engineers and site staff for operation and maintenance, and trouble shooting skills	
5 years performance warranty	As per relevant standard
Engineering design calculations, layout drawings, electrical drawings, installation and O&M manuals	As per relevant standard
Switchgear and protection	Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream. Switchgear should enable protection, which is interruption of short-circuit and overload fault currents while maintaining service to unaffected circuits. Switchgears also should ensure the trouble free isolations of the equipment and enhance system availability by allowing more than one source to feed the load. The proposed PV system shall include, at a minimum, one fused DC disconnect and one fused AC disconnect for safety and maintenance concerns.
Data information and communication system	System in place (eg through inverters) to enable THE CLIENT to access real time information about system performance over internet.

Appendix 2 - Form for submitting the vendor's quotation[1]

We, the undersigned, hereby accept in full THE CLIENT's Request for Quotations' requirements, and hereby offer to supply the items listed below in conformity with the specification and requirements of THE CLIENT.

Item number	Description	Quantity	Unit price (VND)	Total Price (VND)
1	Solar Panel			
2	Power Conditioning Unit			
3	Solar Charge Controller (if applicable)			
4	Batteries (if applicable)			
5	Inverters and Smart Power Management Unit/Assembly			
6	Grid Tie Inverter (if applicable)			
7	Array junction boxes (if applicable)			
8	Ancillaries, Cables, Mounting systems			
9	Lightning and Surge Protection			
10	Earthing complete set			
11	Engineering Design, Calculations, Sizing and Documentation			
12	Site Preparation and Civil Works			
13	Installation, Initial PV System Training and Commissioning.			
14	Internal Power Distribution Panel			

[1] This serves as a guide to the Supplier in preparing the quotation and price schedule.

	(AC/DC) and internal building cabling			
15	Switch gear and protection			
16	Freight/Transportation cost			
Total Cost in VND				
Estimated Time of Delivery (weeks)				

Note: Include any other components based on design by adding rows on the table above.