

RFQ reference: RfQ21/02361 Development of Designs and installation of Photovoltaic Panels on public buildings under the Distributed renewable electricity generation demo project

ANNEX 1: SCHEDULE OF REQUIREMENTS

I. Project Background Information

The objective of the project is to catalyse investments in low carbon green urban development based on integrated urban planning approach, by encouraging innovation, participatory planning, and partnerships between a variety of public and private sector entities.

The strategy of the project is to create, launch and support a new institutional mechanism called “Green City Lab” (GCL) as a vehicle for encouraging and supporting new innovative measures and approaches in addressing the urban development challenges and barriers.

Moldova Sustainable Green Cities Project (MSGCP) in partnership with Green City Lab is targeting the residential and public sectors, part of a broader integrated urban planning approach (IUPA) at a neighbourhood level. It seeks to strengthen the role of the Home Owner Associations (HOAs) to manage their buildings and common property and to contribute to the development of their surroundings, while also supporting them to get their legal status as credit-worthy legal entities with the option to access affordable financing for the required energy efficiency (EE) investments. It also seeks to enhance the exemplary role of public sector, as provisioned in the Directive 2012/27/EU on energy efficiency, transposed in Moldova through Law no.139/2018 on energy efficiency.

The objective of the demo projects, within the MSGCP and GCL framework, is to contribute to the Green Cities project development objective and intended CO₂ reduction of the MSGCP project (200 ktons of CO₂eq. from direct GHG emission reductions). The demo project “Distributed renewable electricity generation” aims to demonstrate the cost benefits of the energy efficiency of installation of photovoltaics on multi-storey residential and public buildings.

II. Objective of the assignment

The overall objective of the assignment is to provide professional services for developing, endorsing, submission and installation of photovoltaics panels on the selected building. The buildings were selected based on an open competition and comparative analysis of cost-benefits of the pre-selected buildings. The responsible party for operating the installed equipment after installation will be GCL and later transferred to buildings owners. The assignment will be carried out in 3 stages:

Stage 1 – Elaboration of design of the PV system for two selected objects:

Object 1. Rooftop of the Sîngerei Rayonal Hospital building (situated on N.Testimiteanu street 51, Sîngerei, MD-6201) with a proposed photovoltaic installation plant of **70 kW**; Geolocation in Google Maps: 47.64505035692287, 28.129778027717254.

Object 2. Building and territory of the Adult and Elderly People Placement Center in village Sculeni, Ungheni rayon, str. Alexandru cel Bun, 16 with a proposed photovoltaic installation plant of **30 kW**. Geolocation in Google Maps: 47.33117877570481, 27.626484675401453 (Building) and 47.33128566645498, 27.62699604476019 (Existing metal construction near the building can be used for PV panels mounting)

At elaboration of the design the following criteria should be taken in to account:

- Full design of the solar PV system to be installed on the rooftop (or other parts or vicinity of the buildings) , according to applicable local and international standards. The plant has to be accessible for cleaning and maintenance, as well as aesthetically pleasing;
- Perform necessary analysis and estimate annual power generation based on guaranteed performance of the main equipment (PV panels and invertors). The standard annual solar radiation to be taken into account is 1459.27 kWh/m² for Object 1, and 1497.1 kWh/m² for Object 2.
- Considering smart metering system with possibility to read data on PC and smart phone. Also, the hourly/daily/monthly produced amount of energy has to be displayed on a screen installed in open space;
- The system has to be designed according to net metering mechanism;
- Installation type and modality of the system to avoid penetrations in the roof cover.
- All installations shall be designed to facilitate inspection, cleaning, and maintenance and to ensure continued operation under conditions prevailing at the site.
- Submission of preliminary and final as built design documentation, including the string design and wiring.
- Obtaining the necessary permissions, connections from the competent institutions in the specific field (RED-Nord, etc.).
- Obtaining the approvals of the authorized experts in the verification and expertise of the design documentation and bill of quantities.
- All designs must be agreed with Beneficiary/Donor prior to commencement of the installation works. Notwithstanding this agreement, the contractor shall be responsible for all design works and ensuring that all installations function correctly in accordance with these designs.

Stage 2 – Based on approved designs for the proposed project, contractor will proceed with installation works, taking into account the following criteria:

- The contractor shall provide details of the manufacturer and the technical specifications for each item of equipment included in the design and quotation. This shall include details for all components/ parts of each installation such as PV modules, inverter, combiner box, including material to be used in the mounting structure, cabling, mounting hardware, meteorological equipment, metering equipment, protection equipment etc. Please provide only one manufacturer/supplier for each item of equipment.
- The contractor shall be responsible for any systems that do not function correctly as a result of improper design and/or improper workmanship. The contractor shall also clearly specify the warranty of the system and where appropriate specific warranties for the main equipment.
- Installation and commissioning of Solar PV system including the smart metering system. The Contractor shall include all associated civil and construction works necessary for the complete installation of all equipment, including but not limited to mounting works, fixation, and anchoring. Pricing, designs and specifications for these works shall also be fully detailed in the quotation

Stage 3 – Final reception, admission and on-grid connection of the PV station:

- The contractor shall ensure on-grid connection of the equipment, including following all necessary procedures and operating necessary adjustments. All related costs will be detailed in the quotation.

Photovoltaic Design Requirements

Basic Principles to follow when Designing a Quality PV System:

- Ensure the roof area or other installation site is capable of handling the desired system size (based on technical expertise report).
- Specify sunlight and weather resistant materials for all outdoor equipment.
- Locate the array to minimize shading from foliage, vent pipes, and adjacent structures.
- Design the system in compliance with all applicable building and electrical codes.
- Design the system with a minimum of electrical losses due to wiring, fuses, switches, and inverters.
- Ensure the design meets local utility interconnection requirements considering the net metering mechanism.

Photovoltaic Installation Requirements

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

➤ Materials:

- Materials used outdoors should be sunlight/UV resistant
- Urethane sealants should be used for all non-flashed roof penetrations in case these penetrations are inevitable.
- Materials should be designed to withstand the temperatures to which they are exposed.
- Dissimilar metals (such as steel and aluminum) should be isolated from one another using non-conductive shims, washers, or other methods.
- Aluminum should not be placed in direct contact with concrete materials.
- Only high-quality fasteners should be used (stainless steel is preferred).
- Structural members should be either:
 - a. corrosion resistant aluminum, hot dip galvanized steel
 - b. stainless steel (particularly for hot and rainy environments)

➤ Equipment and installation methods:

- All electrical equipment should be listed for the voltage and current ratings necessary for the application.
- The yield warranty for the PV modules should be minimum 25 years at minimum 80%.
- Full warranty for all equipment and panels - at least 12 years except the inverter where a minimum 5-year warranty is applied.
- The service life for PV modules and mounting structure is at least 25 years.
- The service life for inverter/s is at least 15 years.
- The efficiency of solar panels must be at least 19.5%.
- The efficiency of the inverter/s must be at least 98%.
- Inverters should be selected with the ability to monitor and transmit data for displaying data on power generation on a screen or computer.
- Minimum 5 years warranty for works.
- All exposed cables or conduits should be sunlight resistant.
- All required overcurrent and lightning 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 and grounded accordingly.
- All roof penetrations should be sealed with an acceptable sealing method that does not adversely impact the roof warranty (roof penetration must be avoided at maximum).

- 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. A small amount of shade can have a disproportionately high impact on system performance.
- CE marking applied and / or ENEC certification for the main equipment (PV panels and invertors) must be provided.
- The warranty includes scheduled maintenance, carried out once a year and unscheduled on the need.
- That contractor liabilities related to warranty of the equipment will be towards GCL and subsequently to the beneficiary (after the MSGCP will transfer the installed equipment to the GCL).

Vendor needs to carry out a site visit for the verification of required details and assessment of installation methods and structural rigidity (to avoid over stressed areas) of roof or slab for the PV panels. It is also required to check the spacing for electrical connections, metering, and monitoring equipment's.

Expected Deliverables and estimated timing

The Contractor is expected to complete all works (all three phases) according to the following timetable:

# Deliverables	Estimated timing
Stage 1	
Development of Design project for photovoltaic panels for Object 1 (70 kW in Sîngerei) and Object 2 (30 kW in Sculeni)	20 days since the date of contract signature
Stage 2	
Installation works of Photovoltaic Plants at Object 1 (70 kW in Sîngerei) and Object 2 (30 kW in Sculeni)	By 30 November 2021
Stage 3	
Final reception and on-grid connection of Photovoltaic Plants at Object 1 (70 kW in Sîngerei) and Object 2 (30 kW in Sculeni).	By 20 December 2021.

Language requirements

All communication and documentation should be prepared in Romanian. Catalogues, instructions, and operating manuals, related to the assignment can be presented in Romanian, English or Russian. The designs and other related documents will be presented in electronic format.

Confidentiality:

- All data and information received from partners with the purpose of elaboration of design works for Photovoltaic Panels installation shall not be disclosed to any person other than the Authorized Recipients, even after completion of the contract.
- All Confidential Information should be kept secret and not used for any purpose other than for the clauses mentioned in this document.

Timeframe

The interested bidders are invited to get acquainted with the locations:

Object 1: on **20.09.2021, 11:00 (Chişinău time)**, N.Testimiteanu street 51, Sîngerei.

Object 2: on **21.09.2021, 11:00 (Chişinău time)**, Alexandru cel Bun street 16, Sculeni village, Ungheni Rayon

The expected period of implementation is October-December 2021.

The applicant shall include information on the volume of allocated resources to carry out the assignment. A breakdown per man-days allocated for each deliverable shall be submitted, clearly explaining the role team members involved.

III. Institutional Arrangement

The contractor will work under the guidance of the Project Manager. The contractor will report to the Project Manager and Cluster Lead, Energy and Environment, UNDP Moldova.

Payments will be disbursed in several instalments, upon submission and approval of deliverables mentioned in the Section “Deliverables and tentative framework” and certification by UNDP Policy Specialist that the services have been satisfactorily performed.

IV. Qualifications and experience requirements

- A legally registered entity.
- Minimum 3 – years’ experience in the electric equipment market, services in electric installations and providing services in this area of interest.
- Minimum 2 (two) completed contracts for provision of solar panels installations works performed by the Proposer as main contractor in the past 3 years in the value not less than 25,000 US\$. Contact details must be provided.
- Average turnover for the past three (3) years shall not be below 50,000 US\$ (in case of consortium applicable for lead company only)
- Professional organizational skills and delivery in a timely and qualitative manner
- ISO certification will be considered an advantage
- Sufficient human resources capability to qualitatively and timely execute the works – minimum key-personnel.

Team members

Two (2) certified Engineers in electrical networks incl. external electricity networks (1 engineer assigned per each object)

- University degree in Electrical Network, Engineering, or another related field.
- At least 5 years of professional experience in Electrical Network, Engineering, or other related field;
- Fluency in Romanian and Russian. Knowledge of English will be an advantage

During the assignment, the Contractor’s team of experts should prove commitment to the core values of the United Nations, in particular, respecting differences of culture, gender, religion, ethnicity, nationality, language, age, HIV status, disability, and sexual orientation, or other status.

UNDP Moldova is committed to workforce diversity. Women, persons with disabilities, Roma and other ethnic or religious minorities, persons living with HIV, as well as refugees and other non-citizens legally

entitled to work in the Republic of Moldova, are particularly encouraged to apply. Applicants demonstrating equitable gender representation and diversity within the team will have an advantage.

V. Scope of Proposal Price and Schedule of Payments

The contract price is a fixed output-based price regardless of extension of its duration. All envisaged travel costs must be included in the financial proposal. This includes all travel to join duty station/repatriation travel. In general, UNDP should not accept travel costs exceeding those of an economy class ticket.

Payments will be made upon submission of deliverables and according to the following payment schedule:

Deliverable	Proportion of payment disbursed	Target date
Stage 1		
Development of Design project for photovoltaic panels for Object 1 (70 kW in Sîngerei) and Object 2 (30 kW in Sculeni)	20 %	By 30 October 2021
Stage 2		
Installation works of Photovoltaic Plants at Object 1 (70 kW in Sîngerei) and Object 2 (30 kW in Sculeni)	60 %	By 30 November 2021
Stage 3		
Final reception and on-grid connection of Photovoltaic Plants at Object 1 (70 kW in Sîngerei) and Object 2 (30 kW in Sculeni).	20 %	By 20 December 2021.