INVITATION TO BID (ITB)

Supply, Installation, Commissioning, and Provision of Operation and Maintenance Support of a Hybrid Solar PV diesel System at TAYYEBAT facility in Insariyeh, South Lebanon, Lebanon

ITB No.: LBN/CO/ITB/6/24

Project: 00118152-C5

Country: Lebanon

Issued on: 10 January 2024

SECTION 1: LETTER OF INVITATION

United Nations Development Programme, hereinafter referred to as UNDP hereby invites prospective bidders to submit a bid in accordance with the General Conditions of Contract and the Schedule of Requirements as set out in this Invitation to Bid (ITB).

To enable you to submit a bid, please read the following attached documents carefully.

Section 1: This Letter of Invitation
Section 2: Instructions to Bidders
Section 3: Data Sheet
Section 4: Evaluation Criteria
Section 5: Schedule of Requirements
Section 6: Conditions of Contract and Contract Forms
Section 7: Bidding Forms

- Form A: Bid Confirmation
- Form B: Checklist
- Form C: Bid Submission
- Form D: Bidder Information
- Form E: Joint Venture/Consortium/Association Information
- Form F: Eligibility and Qualification
- Form G: Technical Bid
- Form H: Price Schedule

If you are interested in submitting a bid in response to this ITB, please prepare your bid in accordance with the requirements and procedure as set out in this ITB and submit it by the deadline for submission of bids set out in this document and in the supplier portal.

Please indicate whether you intend to submit a bid by creating a draft response without submitting directly in the system. This will enable the system to send notifications in case of amendments of the tender requirements. Should you require further clarifications, kindly communicate using the messaging functionality in the system. Offers must be submitted directly in the system following this link: http://supplier.quantum.partneragencies.org/ using the profile you may have in the portal. In case you have never registered before, follow the Supplier Portal Registration Link to register a profile in the system. Do not create a new profile if you already have one. Use the forgotten password feature in case you do not remember the password or the username from previous registration.

We look forward to receiving your bid.

Procurement Unit

10 January 2024

SECTION 2: INSTRUCTIONS TO BIDDERS

GENERAL	
Scope	Bidders are invited to submit a bid for the case specified in Section 5: Schedule of Requirements, in accordance with this Invitation to Bid (ITB). A summary of the scope of the bid is included in Section 3: Data Sheet. Bidders shall adhere to all the requirements of this ITB, including any amendment made in writing by UNDP. This ITB is conducted in accordance with Policies and Procedures of UNDP which can be accessed at https://popp.undp.org/SitePages/POPPRoot.aspx.
Interpretation of the ITB	Any bid submitted will be regarded as an offer by the bidder and does not constitute or imply the acceptance of the bid by UNDP. UNDP is under no obligation to award a contract to any bidder as a result of this ITB.
Supplier Code of Conduct	All bidders must read the United Nations Supplier Code of Conduct and acknowledge that it provides the minimum standards expected of suppliers to the UN. The Code of Conduct, which includes **principles on labour, human rights, environment and ethical conduct** may be may be found at: https://www.un.org/Depts/ptd/about-us/un-supplier-code-conduct Moreover, suppliers should note that certain provisions of the Code of Conduct will be binding on the supplier in the event that the supplier is awarded a contract, pursuant to the terms and conditions of any such contract. The bidder must acknowledge that UNDP strictly enforces a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, unethical or unprofessional practices. UNDP's Anti-Fraud Policy can be found at http://www.undp.org/content/undp/en/home/operations/accountability/audit/office_of_audit_andinvestigation.html#anti In pursuance of this policy, UNDP: - Shall reject a bid if it determines that the selected bidder has engaged in any corrupt or fraudulent practices in competing for the contract in question; - Further to the UNDP's vendor sanctions policy, shall declare a vendor ineligible, either indefinitely or for a stated period, to be awarded a contract if at any time it determines that the vendor has engaged in any corrupt or fraudulent practices in competing for, or in executing a UNDP contract.
Eligible bidders/Conflict of Interest	Bidders shall have the legal capacity to enter into a binding contract with UNDP. A bidder, and all parties constituting the bidder, may have the nationality of any country with the exception of the nationalities, if any, listed in Section 3: Data Sheet. A bidder shall be deemed to have the nationality of a country if the bidder it is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country. All bidders found to have a conflict of interest shall be disqualified. Bidders may be considered to have a conflict of interest if they are or have been associated in the past, with a firm or any of its affiliates that have been engaged by UNDP to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods, services or works required in the present procurement process and/or are found to be in conflict for any other reason, as may be established by, or at the discretion of UNDP. In the event of any uncertainty in the interpretation of a potential conflict of interest, Bidders must disclose to UNDP, and seek UNDP's confirmation on whether or not such conflict exists. Similarly, the Bidders must disclose in their Bid their knowledge of the following: a. If the owners, part-owners, officers, directors, controlling shareholders, of the bidding entity or key personnel who are family members of UNDP staff involved in the procurement

	functions and/or the Government of the country or any Implementing Partner receiving goods and/or services under this ITB; and b. All other circumstances that could potentially lead to actual or perceived conflict of interest, collusion or unfair competition practices. Failure to disclose such an information may result in the rejection of the Bid or Bids affected by the non-disclosure. The eligibility of Bidders that are wholly or partly owned by the Government shall be subject to UNDP's further evaluation and review of various factors such as being registered, operated and managed as an independent business entity, the extent of Government ownership/share, receipt of subsidies, mandate and access to information in relation to this ITB, among others. Conditions that may lead to undue advantage against other Bidders may result in the eventual rejection of the Bid. Bidders shall not be eligible to submit a bid if at the time of bid submission: 1- is included in the Ineligibility List, hosted by UNGM, that aggregates information disclosed by Agencies, Funds or Programs of the UN System; 2- is included in the Consolidated United Nations Security Council Sanctions List, including the UN Security Council Resolution 1267/1989 list; 3- is included in the World Bank Corporate Procurement Listing of Non-Responsible Vendors and World Bank Listing of Ineligible Firms and Individuals.
Eligible goods, works and services	All goods, works and/or services to be supplied under the contract shall have their origin in any country with the exception of the countries, if any, listed in Section 3: Data Sheet**,** and all expenditures made under the contract will be limited to such goods, works and services. For purposes of this clause, "origin" means the place where the goods are mined, grown, or produced, or the place from which the related services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components. The origin of goods, works and services is distinct from the nationality of the bidder.
Proprietary information	The ITB documents and any specifications, plans, drawings, patterns, samples or information issued or furnished by UNDP are issued solely for the purpose of enabling a bid to be completed and may not be used for any other purpose. The ITB documents and any additional information provided to bidders shall remain the property of UNDP. All documents which may form part of the bid will become the property of UNDP, who will not be required to return them to your firm.
Publicity	During the ITB process, a bidder is not permitted to create any publicity in connection with the ITB.
SOLICITATION DOCUMENTS	
Clarification of solicitation documents	Bidders may request clarifications on any of the ITB documents no later than the date indicated in Section 3: Data Sheet. Any request for clarification must be sent in writing in the manner indicated in Section 3: Data Sheet. Explanations or interpretations provided by personnel other than the named contact person will not be considered binding or official. UNDP will provide the responses to clarifications through the method specified in Section 3: Data Sheet. UNDP shall endeavour to provide responses to clarifications in an expeditious manner, but any delay in such response shall not cause an obligation on the part of UNDP to extend the submission date of the bids, unless UNDP deems that such an extension is justified and necessary.
Amendment of solicitation documents	At any time prior to the deadline of bid submission, UNDP may for any reason, such as in response to a clarification requested by a bidder, modify the ITB in the form of an amendment to the ITB. Amendments will be made available to all prospective bidders. If the amendment is substantial, UNDP may extend the Deadline for submission of bid to give the bidders reasonable time to incorporate the amendment into their bids.

PREPARATION OF BIDS	
Cost of preparation of bid	The bidder shall bear all costs related to the preparation and/or submission of the bid, regardless of whether its bid is selected or not. UNDP shall not be responsible or liable for those costs, regardless of the conduct or outcome of the procurement process.
Language	The bid, as well as any and all related correspondence exchanged by the bidder and UNDP, shall be written in the language(s) specified in Section 3: Data Sheet.
Documents comprising the bid	The bid shall comprise of the following documents and related forms which details are provided in Section 3: Data Sheet: a) Documents establishing the eligibility and qualifications of the bidder; b) Technical bid c) Price Schedule d) Bid Security (if required) e) Advance Payment Guarantee (if required) f) Performance Security (if required) g) Any attachments and/or appendices to the bid.
Documents establishing eligibility and qualifications of the bidder	The bidder shall furnish documentary evidence of its status as an eligible and qualified vendor, using the Forms provided in Section 7 and providing the documents required in those forms. In order to award a contract to a bidder, its qualifications must be documented to UNDP's satisfaction.
Technical bid	The bidder is required to submit a technical bid using the Form provided in Section 7 and taking into consideration the requirements in the ITB.
Price Schedule	The Price Schedule shall be prepared using the Form provided in Section 7 and taking into consideration the requirements in the ITB. The prices and discounts quoted by the bidder shall conform to the requirements specified below. ● All items and lots (if applicable) must be listed and priced separately. ● The price to be quoted shall be the total price of the bid, excluding any discounts offered. ● The bidder shall quote any unconditional discounts and indicate the method for their application. ● The INCOTERM shall be governed by the rules prescribed in the 2020 edition of INCOTERMS, published by The International Chamber of Commerce. The INCOTERM rules and place of destination is specified in Section 5: Schedule of Requirements. ● Prices quoted by the bidder shall be fixed during the bidder's performance of the contract and not subject to variation on any account, unless otherwise specified in Section 3: Data Sheet. A bid submitted with an adjustable price shall be treated as non-compliant and shall be rejected. However, if in accordance with Section 3: Data Sheet, prices quoted by the bidder shall be subject to adjustment during the performance of the Contract, a bid submitted with a fixed price quotation shall not be rejected, but the price adjustment shall be treated as zero. ● If indicated in Section 3: Data Sheet that bids are being invited for individual contracts (lots) and unless otherwise indicated in Section 3: Data Sheet, prices quoted shall correspond to 100 % of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Bidders wishing to offer any price reduction (discount) for the award of more than one Lot shall specify the applicable price reduction.
Bid currencies	All prices shall be quoted in the currency or currencies indicated in Section 3: Data Sheet. Where bids are quoted in different currencies, for the purposes of comparison of all bids: • UNDP will convert the currency quoted in the bid into the UNDP preferred currency, in accordance with the prevailing UN Operational Rate of Exchange on UNDP; and • In the event that UNDP selects a bid for award that is quoted in a currency different from the preferred currency in Section 3: Data Sheet, UNDP shall reserve the right to award

	the contract in the currency of UNDP's preference, using the conversion method specified above.
Duties and taxes	Article II, Section 7, of the Convention on the Privileges and Immunities provides, inter alia, that the United Nations, including UNDP as a subsidiary organ, is exempt from all direct taxes, except charges for public utility services, and is exempt from customs restrictions, duties, and charges of a similar nature in respect of articles imported or exported for its official use. All bids shall be submitted net of any direct taxes and any other taxes and duties, unless otherwise specified in Section 3: Data Sheet.
Bid validity period	Bids shall remain valid for the period specified in Section 3: Data Sheet, commencing on the deadline for submission of bids. A bid valid for a shorter period may be rejected by UNDP and rendered non-responsive. During the bid validity period, the bidder shall maintain its original bid without any change, including the availability of the key personnel, the proposed rates and the total price. In exceptional circumstances, prior to the expiration of the bid validity period, UNDP may request bidders to extend the period of validity of their bids. The request and the responses shall be made in writing, and shall be considered integral to the bid. If the bidder agrees to extend the validity of its bid, it shall be done without any change to the original bid, but will be required to extend the validity of the bid security, if required, for the period of the extension, and in compliance with Article 19 (Bid security) in all respects. The bidder has the right to refuse to extend the validity of its bid without forfeiting the bid security, if required, in which case, the bid shall not be further evaluated.
Bid Security	A bid security, if required by Section 3: Data Sheet, shall be provided in the amount and form indicated in the Section 3: Data Sheet. The bid security shall be valid for a minimum of thirty (30) days after the final date of validity of the bid. The bid security shall be included along with the bid. If a bid security is required by the ITB but is not found in the bid, the offer shall be rejected. If the bid security amount or its validity period is found to be less than is required by UNDP, UNDP shall reject the bid. In the event an electronic submission is allowed in Section 3: Data Sheet, bidders shall include a copy of the bid security in their bid and the original of the bid security must be sent via courier or hand delivery as per the instructions in Section 3: Data Sheet. Unsuccessful bidders' bid securities will be discharged/returned as promptly as possible but no later than thirty (30) days after the expiration of the period of bid validity prescribed by UNDP pursuant to Article 18 (Bid Validity Period). The bid security may be forfeited by UNDP, and the bid rejected, in the event of any, or combination, of the following conditions: A. If the bidder withdraws its offer during the period of the bid validity specified in Section 3: Data Sheet, or; B. In the event the successful bidder fails: ○ to sign the Contract after UNDP has issued an award; or ○ to furnish the Performance Security, insurances, or other documents that UNDP may require as a condition precedent to the effectivity of the contract that may be awarded to the bidder.
Joint Venture, Consortium or Association	If the bidder is a group of legal entities that will form or have formed a Joint Venture (JV), Consortium or Association for bid, each such legal entity will confirm in their joint bid that: • they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the JV, Consortium or Association jointly and severally, and this will be evidenced by a duly notarised Agreement among the legal entities,

	which will be submitted along with the bid; and • if they are awarded the contract, the contract shall be entered into by and between UNDP and the designated lead entity, who will be acting for and on behalf of all the member entities comprising the joint venture. After the deadline for submission of bid, the lead entity identified to represent the JV, Consortium or Association shall not be altered without the prior written consent of UNDP. If a JV, Consortium or Association's bid is the bid selected for award, UNDP will award the contract to the joint venture, in the name of its designated lead entity. The lead entity will sign the contract for and on behalf of all other member entities. The lead entity and the member entities of the JV, Consortium or Association shall abide by the provisions of Article 21 (Only one Bid) herein in respect of submitting only one bid. The description of the organization of the JV, Consortium or Association must clearly define the expected role of each of the entities in the joint venture in delivering the requirements of the ITB, both in the bid and the JV, Consortium or Association Agreement. All entities that comprise the JV, Consortium or Association shall be subject to the eligibility and qualification assessment by UNDP. A JV, Consortium or Association in presenting its track record and experience should clearly differentiate between: • Those that were undertaken together by the JV, Consortium or Association; and • Those that were undertaken by the individual entities of the JV, Consortium or Association. Previous contracts completed by individual experts working privately but who are permanently or were temporarily associated with any of the member firms cannot be claimed as the experience of the JV, Consortium or Association or those of its members, but should only be claimed by the individual experts themselves in their presentation of their individual credentials. JV, Consortium or Associations are encouraged for high value, multi-sectoral requirements when the spectrum of expertise and resources required may not be available within one firm.
Only one bid	The bidder (including the individual members of any Joint Venture) shall submit only one bid, either in its own name or as part of a Joint Venture. Bids submitted by two (2) or more bidders shall all be rejected if they are found to have any of the following: • they have at least one controlling partner, director or shareholder in common; or • any one of them receive or have received any direct or indirect subsidy from the other/s; or • they have the same legal representative for purposes of this ITB; or • they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about, or influence on the bid of another bidder regarding this ITB process; • they are subcontractors to each other's bid, or a subcontractor to one bid also submits another bid under its name as lead bidder; or some key personnel proposed to be in the team of one bidder participates in more than one bid received for this ITB process. This condition relating to the personnel, does not apply to subcontractors being included in more than one bid.
Alternative bids	Unless otherwise specified in Section 3: Data Sheet, alternative bids shall not be considered. If submission of alternative bid is allowed in Section 3: Data Sheet, a bidder may submit an alternative bid, but only if it also submits a bid conforming to the ITB requirements. Where the conditions for its acceptance are met, or justifications are clearly established, UNDP reserves the right to award a contract based on an alternative bid. If multiple/alternative bids are being submitted, they must be clearly marked as "Main Bid" and

	"Alternative Bid". If no indication is provided as to which bid is the main bid and which is/are the alternative bid(s), then all bids will be rejected.
Pre-bid conference	When appropriate, a pre-bid conference will be conducted at the date, time and location and according to any instructions specified in Section 3: Data Sheet. If it is stated in Section 3: Data Sheet that the pre-bid conference is mandatory, a bidder which does not attend the pre-bid conference shall become ineligible to submit a bid under this ITB. If it is stated in Section 3: Data Sheet that the pre-bid conference is not mandatory, non-attendance shall not result in disqualification of an interested bidder. UNDP will not issue any formal answers to questions from bidders regarding the ITB or bid process during the pre-bid conference. All questions shall be submitted in accordance with Article 41 (Clarification of Bids). The pre-bid conference shall be conducted for the purpose of providing background information only. Without limiting Article 26 (Bidders Responsibility) bidders shall not rely upon any information, statement or representation made at the pre-bid conference unless that information, statement or representation is confirmed by UNDP in writing. Minutes of the pre-bid conference will be disseminated as specified in Section 3: Data Sheet. No verbal statement made during the conference shall modify the terms and conditions of the ITB, unless specifically incorporated in the minutes of the bidder's conference or issued/posted as an amendment to ITB.
Site inspection	When appropriate, a site inspection will be conducted at the date, time and location and according to any instructions specified in Section 3: Data Sheet. If it is stated in Section 3: Data Sheet that the site inspection is mandatory, a bidder which does not attend the site inspection shall become ineligible to submit a bid under this ITB. If it is stated in Section 3: Data Sheet that the site inspection is not mandatory, non-attendance, shall not result in disqualification of an interested bidder. Bidders participating in a site inspection shall be responsible for making and obtaining any visa arrangements that may be required for the bidders to participate in a site inspection. Prior to attending a site inspection, bidders shall execute an indemnity and a waiver releasing UNDP in respect of any liability that may arise from: ◘ loss of or damage to any real or personal property; ◘ personal injury, disease or illness to, or death of, any person; ◘ financial loss or expense, arising out of the carrying out of that site inspection; and ◘ transportation by UNDP to the site (if provided) as a result of any accidents or malicious acts by third parties. UNDP will not issue any formal answers to questions from bidders regarding the ITB or bid process during a site inspection. All questions shall be submitted in accordance with Article 8 (Clarification of solicitation documents). A site inspection will be conducted for the purpose of providing background information only. Without limiting Article 26 (Bidders Responsibility), bidders shall not rely upon any information, statement or representation made at a site inspection unless that information, statement or representation is confirmed by UNDP in writing.
Errors or omissions	Bidders shall immediately notify UNDP in writing of any ambiguities, errors, omissions, discrepancies, inconsistencies or other faults in any part of the ITB, with full details of those ambiguities, errors, omissions, discrepancies, inconsistencies or other faults. Bidders shall not benefit from such ambiguities, errors, omissions, discrepancies, inconsistencies or other faults.

Bidders responsibility to inform themselves	Bidders shall be responsible for informing themselves in preparing their bid. In this regard, bidders shall ensure that they: I. examine and fully inform themselves in relation to all aspects of the ITB, including the Contract and all other documents included or referred to in this ITB; II. review the ITB to ensure that they have a complete copy of all documents; III. obtain and examine all other information relevant to the project and the scope of the requirements available on reasonable enquiry; IV. verify all relevant representations, statements and information, including those contained or referred to in the ITB or made orally during any clarification meeting or site Inspection or any discussion with UNDP, its employees or agents; V. attend any Pre-bid conference or site inspection if it is mandatory under this ITB; VI. fully inform and satisfy themselves as to requirements of any relevant authorities and laws that apply, or may in the future apply, to the supply of the goods, works and/or services; and VII. form their own assessment of the nature and extent of the goods, works and /or services required as included in Section 5: Schedule of Requirements and properly account for all requirements in their bid. Bidders acknowledge that UNDP, its directors, employees and agents make no representations or warranties (express or implied) as to the accuracy, currency or completeness of this ITB or any other information provided to the bidders.
No material change(s) in circumstances	The bidder shall inform UNDP of any change(s) of circumstances arising during the ITB process, including but not limited to: • a change affecting any declaration, accreditation, license or approval; • major re-organisational changes, company re-structuring, a take-over, buy-out or similar event(s) affecting the operation and/or financing of the bidder or its major sub-contractors; • a change to any information on which UNDP may rely in assessing bids.
SUBMISSION AND OPENING OF BIDS	
Instruction for bid submission	The bidder shall submit a duly signed and complete bid comprising the documents and forms in accordance with requirements in Section 3: Data Sheet. The Price Schedule shall be submitted together with the Technical Bid. The bid shall be delivered according to the method specified in Section 3: Data Sheet. The bid shall be signed by the bidder or person(s) duly authorized to commit the bidder. The authorization shall be communicated through a document evidencing such authorization issued by the legal representative of the bidding entity, or, if requested, a Power of Attorney, accompanying the bid. Bidders must be aware that the mere act of submission of a bid, in and of itself, implies that the bidder fully accepts the UNDP General Conditions of Contract. Electronic submission through the portal, if allowed as specified in the BDS, shall be governed as follows: 1. Electronic files that form part of the Bid must be in accordance with the format and requirements indicated in BDS; 2. Documents which are required to be in original form (e.g. Bid Security, etc.) must be sent via courier or hand delivered as per the instructions in BDS.
Deadline for bid submission	Complete bids must be received by UNDP in the manner, and no later than the date and time, specified in Section 3: Data Sheet. If any doubt exists as to the time zone in which the Bid should be submitted, refer to http://www.timeanddate.com/worldclock/. It shall be the sole responsibility of the bidders to ensure that their bid is received by the closing date and time. UNDP shall accept no responsibility for bids that arrive late due to the courier company or any technical issues and shall only recognise the actual date and time that the bid was received by

	UNDP. UNDP may, at its discretion, extend this deadline for the submission of bids by amending the solicitation documents in accordance with Article 9 Amendment of solicitation documents. In this case, all rights and obligations of UNDP and bidders subject to the previous deadline will thereafter be subject to the new deadline as extended.
Withdrawal, substitution and modification of bids	A bidder may withdraw, substitute or modify its bid after it has been submitted at any time prior to the deadline for submission by sending a written notice to UNDP, duly signed by an authorized representative and shall include a copy of the authorization (or a Power of Attorney). The corresponding substitution or modification of the bid, if any, must accompany the respective written notice. All notices must be submitted in the same manner as specified for submission of bids, by clearly marking them as "WITHDRAWAL", "SUBSTITUTION" OR "MODIFICATION". However, after the deadline for bid submission, the bids shall remain valid and open for acceptance by UNDP for the entire bid validity period, as may be extended. Quantum: A Bidder may modify its Bid by revising the Bid directly in the system. It is the responsibility of the Bidder to properly follow the system instructions, duly revise and submit a modification of the Bid as needed. Detailed instructions on how to revise a Bid directly in the system are provided in the Bidder User Guide.
Storage of bids	Bidders are encouraged to submit their bid in good time to avoid last minute challenges. Bids submitted in the supplier portal are kept confidential and secure by the system and no one in the organization has access to such information until deadline has passed and bids have been opened.
Bid opening	Once deadline has passed, bids will be opened for evaluation as per the UNDP evaluation procedures. If Public Bid Opening is provisioned, a Public Bid Opening report will be sent automatically by the system to all bidders who have posted a successful bid indicating names of the companies and their total bid price.
Late bids	In exceptional circumstances, bid received outside portal within or after deadline may be accepted if it is determined that it was due to factors not reasonably foreseen by the bidder or was due to force majeure. Such bids received by UNDP will be destroyed unless the bidder requests that it be returned and assumes the responsibility and expenses for the re-possession of the returned bidding documents.
EVALUATION OF BIDS	
Confidentiality	Information relating to the examination, evaluation, and comparison of bids, and the recommendation of contract award, shall not be disclosed to bidders or any other persons not officially concerned with such process, even after publication of the contract award. Any effort by a bidder or anyone on behalf of the bidder to influence UNDP in the examination, evaluation and comparison of the bids or contract award decisions may, at UNDP's decision, result in the rejection of its bid and may subsequently be subject to the application of prevailing UNDP's vendor sanctions procedures.
Evaluation of bids	UNDP shall evaluate a bid using only the methodologies and criteria defined in this ITB. No other criteria or methodology shall be permitted. UNDP shall conduct the evaluation solely on the basis of the bids received according to the evaluation criteria in Section 4. Evaluation of bids shall be undertaken in the following steps: 1.1 Preliminary examination 1.2 Evaluation of eligibility and qualification 1.3 Evaluation of technical bids 1.4 Evaluation of prices of bids found to be substantially compliant Detailed evaluation will be focussed on the 3 - 5 lowest priced bids. Further higher priced bids

	shall be added for evaluation if necessary After completion of the evaluation, but prior to award, UNDP shall conduct a Post-qualification assessment of the bidder recommended for award (if pre-qualification was not done) as per Article 40 (Post-qualification).
Preliminary examination	UNDP shall examine the bids to determine whether they are complete with respect to minimum documentary requirements, whether the documents have been properly signed, and whether the bids are generally in order, among other indicators that may be used at this stage. UNDP reserves the right to reject any bid at this stage.
Evaluation of eligibility and qualification	Eligibility and Qualification of the bidder will be evaluated against the Minimum Eligibility/Qualification requirements specified in Section 4: Evaluation Criteria and in Article 4 (Eligible Bidders). In general terms, vendors that meet the following criteria may be considered qualified: a) They are not included in the UN Security Council 1267/1989 Committee's list of terrorists and terrorist financiers, and in UNDP's ineligible vendors' list; b) They have a good financial standing and have access to adequate financial resources to perform the contract and all existing commercial commitments, c) They have the necessary similar experience, technical expertise, production capacity, quality certifications, quality assurance procedures and other resources applicable to the supply of goods and/or services required; d) They are able to comply fully with the UNDP General Terms and Conditions of Contract; e) They do not have a consistent history of court/arbitral award decisions against the Bidder; and f) They have a record of timely and satisfactory performance with their clients.
Evaluation of technical bids	Technical evaluation will be conducted to establish substantial compliance, as per the criteria included in Section 4: Evaluation Criteria. When the bid varies in one or more aspect/s from the minimum technical specifications and/or delivery requirements specified in Section 5: Schedule of Requirements, the bid will not be considered substantially compliant and will not be evaluated further. When necessary, and if stated in the BDS, UNDP may invite technically responsive bidders for a presentation related to their technical Bids. The conditions for the presentation shall be provided in the bid document where required.
Evaluation of prices	The prices of bids found to be substantially compliant, will be compared to identify the most substantially compliant bid which represents the lowest overall costs to UNDP.
Post-qualification/Due diligence	UNDP reserves the right to undertake a post-qualification assessment, aimed at determining, to its satisfaction, the validity of the information provided by the bidder. Such exercise shall be fully documented and may include, but need not be limited to, all or any combination of the following: ○ Verification of accuracy, correctness and authenticity of information provided by the bidder; ○ Validation of extent of compliance to the ITB requirements and evaluation criteria based on what has so far been found by the evaluation team; ○ Inquiry and reference checking with Government entities with jurisdiction on the bidder, or with previous clients, or any other entity that may have done business with the bidder; ○ Inquiry and reference checking with previous clients on the performance on on-going or completed contracts, including physical inspections of previous works, as deemed necessary; ○ Physical inspection of the bidder's offices, branches or other places where business transpires, with or without notice to the bidder; ○ Other means that UNDP may deem appropriate, at any stage within the selection process, prior to awarding the contract.

Clarification of bids	UNDP may request clarification or further information in writing from the bidders at any time during the evaluation process. The bidders' responses shall not contain any changes regarding the substance or price of the bid, except to confirm the correction of arithmetic errors discovered by UNDP in the evaluation of the bids, in accordance with Instructions to Bidders Article 25 (Errors or omissions). UNDP may use such information in interpreting and evaluating the relevant bid but is under no obligation to take it into account. Any unsolicited clarification submitted by a Bidder in respect to its Bid, which is not a response to a request by UNDP, shall not be considered during the review and evaluation of the Bids.
Responsiveness of bid	UNDP's determination of a bid's responsiveness is to be based on the contents of the bid itself. A substantially responsive bid is one that conforms to all the terms, conditions, and specifications of the bidding documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that: - affects in any substantial way the scope, quality, or performance of the goods, services and/or works specified in the contract; or - limits in any substantial way, inconsistent with the bidding documents, UNDP's rights or the bidder's obligations under the contract; or - if rectified would unfairly affect the competitive position of other bidders presenting substantially responsive bids. If a bid is not substantially responsive, it shall be rejected by UNDP and may not subsequently be made responsive by the bidder by correction of the material deviation, reservation, or omission.
Nonconformities, reparable errors and omission	Provided that a bid is substantially responsive, UNDP may waive any non-conformities or omissions in the bid that, in the opinion of UNDP, do not constitute a material deviation. These are a matter of form and not of substance and can be corrected or waived without being prejudicial to other bidders. Provided that a bid is substantially responsive UNDP may request the bidder to submit the necessary information or documentation, within a reasonable period, to rectify nonmaterial nonconformities or omissions in the bid related to documentation requirements. Such omission shall not be related to any aspect of the price of the bid. Failure of the bidder to comply with the request may result in the rejection of its bid. For bids that have passed the preliminary examination, UNDP shall check and correct arithmetical errors as follows: - if there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of UNDP there is an obvious misplacement of the decimal point in the unit price; in which case, the line item total as quoted shall govern and the unit price shall be corrected; - if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and - if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. If the bidder that submitted the lowest evaluated bid does not accept the correction of errors, its bid shall be rejected and its bid security may be forfeited.
Right to accept any bid and to reject any or all bids	UNDP reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for UNDP's action. UNDP shall not be obliged to award the contract to the lowest priced offer.

Samples	Where required as per Section 5: Schedule of Requirements, free, non-returnable samples shall be provided by the bid submission deadline for evaluation and testing by UNDP or their representative, of the item and/or the packing and packaging, prior to any award. Samples will be subject to technical review and laboratory analysis where appropriate. Samples provided to UNDP are non-returnable, unless otherwise stated. Samples should be marked with the ITB number. If a bidder fails to provide samples or documents requested by UNDP in a timely manner, UNDP may declare the bid unsuccessful.
AWARD OF CONTRACT	
Award criteria	In the event of a Contract award, UNDP shall award the Contract to a bidder who has been determined as eligible and qualified and whose bid has been determined to be the lowest priced, substantially compliant offer to the ITB. UNDP reserves the right to conduct negotiations with the bidder recommended for award on the content of their bid.
Right to vary requirement at time of award	At the time the Contract is awarded, UNDP reserves the right to increase or decrease the quantity of goods, works and/or services, by up to a maximum twenty-five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions
Notification of award	Prior to the expiration of the period of bid validity, UNDP will notify the successful bidder in writing by email, fax or post, that its bid has been accepted. Please note that the bidder, if not already registered at the appropriate level in UNGM, will be required to complete the vendor registration process on the UNGM prior to the signature and finalization of the contract.
Debriefing	In the event that a bidder is unsuccessful, the bidder may request a debriefing from UNDP. The purpose of the debriefing is to discuss the strengths and weaknesses of the bidder's submission, in order to assist the bidder in improving its future bids for UNDP procurement opportunities. The content of other bids and how they compare to the bidder's submission shall not be discussed.
Publication of Contract Award	UNDP will publish the contract award on UNDP Procurement Notices website https://procurement-notices.undp.org/view_awards.cfm with the ITB reference number, the information of the awarded bidder company name, contract amount or LTA and the date of the contract.
Contract Signature	Within fifteen (15) days from the date of receipt of the Contract, the successful Bidder shall sign and date the Contract and return it to UNDP. Failure to do so may constitute sufficient grounds for the annulment of the award, and forfeiture of the Bid Security, if any, and on which event, UNDP may award the Contract to the Second highest rated or call for new Bids.
Contract Type and General Terms and Conditions	The types of Contract to be signed and the applicable UNDP Contract General Terms and Conditions, as specified in BDS, can be accessed at http://www.undp.org/content/undp/en/home/procurement/business/how-we-buy.html
Performance security	The successful bidder, if so specified in Section 3: Data Sheet shall furnish a performance security in the amount and form specified therein, within the specified number of days after receipt of the contract from UNDP. Banks issuing performance securities must be acceptable to the UNDP comptroller, i.e. banks certified by the central bank of the country to operate as a commercial bank. UNDP shall promptly discharge the bid securities of the unsuccessful bidders pursuant to Article 19 (Bid Security). The Performance Security form is available here Failure of the successful bidder to submit the above-mentioned performance security or sign the contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security. In that event UNDP may award the contract to the next lowest evaluated bidder, whose offer is substantially responsive and is determined by UNDP to be qualified to perform the contract satisfactorily.
Bank guarantee for advance payment	Except when the interests of UNDP so require, it is UNDP's standard practice not to make advance payment(s) (i.e., payments without having received any outputs). If an advance payment is allowed as per Section 3: Data Sheet, and if specified there, the bidder shall submit a Bank Guarantee in the full amount of the advance payment using this bank guarantee form. Banks issuing bank guarantees must be acceptable to the UNDP comptroller, i.e. banks certified by the central bank of the country to operate as a commercial bank.

Liquidated Damages	If specified in Section 3: Data Sheet, UNDP shall apply Liquidated Damages for the damages and/or risks caused to UNDP resulting from the Contractor's delays or breach of its obligations as per the Contract.
Bid protest	Any bidder that believes to have been unjustly treated in connection with this bid process or any contract that may be awarded as a result of such bid process may submit a complaint to UNDP. The following link provides further details regarding UNDP vendor protest procedures: http://www.undp.org/content/undp/en/home/procurement/business/protest-and-sanctions.html
Other Provisions	In the event that the Bidder offers a lower price to the host Government (e.g. General Services Administration (GSA) of the federal government of the United States of America) for similar goods and/or services, UNDP shall be entitled to the same lower price. The UNDP General Terms and Conditions shall have precedence. UNDP is entitled to receive the same pricing offered by the same Contractor in contracts with the United Nations and/or its Agencies. The UNDP General Terms and Conditions shall have precedence. The United Nations has established restrictions on employment of (former) UN staff who have been involved in the procurement process as per bulletin ST/SGB/2006/15 http://www.un.org/en/ga/search/view_doc.asp?symbol=ST/SGB/2006/15&referer

SECTION 3: DATA SHEET

The following specific data shall complement, supplement or amend the Provisions in Section 2: Instructions to Bidders. In case there is a conflict, the provisions herein shall prevail over those in Section 2: Instructions to Bidders.

Ref. Article in Section 2		Specific Instructions / Requirements
1.	Scope	The reference number of this Invitation to Bid (ITB) is **LBN-CO-ITB-6-24** The works include **Supply, Installation, Commissioning, and Provision of Operation and Maintenance Support of a Hybrid Solar PV diesel System at TAYYEBAT facility in Insariyeh, South Lebanon, Lebanon** as further described in Section 5 of this ITB. Maximum expected duration of contract is as following: **Four (4) Months from Contract Signature**
4.	Eligible bidders	Bidders from the following countries are excluded from this bidding process: [As per the National Laws] **Note: UNDP reserves the right to request additional counterparty information regarding Anti-Money Laundering (AML) and Countering the Financing of Terrorism (CFT) in any stage of the process.**
5.	Eligible goods, works and services	Goods, works and/or services with origin in the following countries are excluded from this bidding process: [As per the National Laws]
8.	Clarification of solicitation documents	Bidders must send their questions in the system using the messaging feature. Only in case of facing difficulties to register in the system and sending messages, bidder can write to the contact below to request support with the system: Focal Person: Procurement Unit Address: Qubic Center Sin El fil Beirut Lebanon
		Deadline for submitting requests for clarifications / questions: Date: 5 days prior to the deadline for submission
		UNDP will post the clarifications directly to the system. **Attention: Any delay in UNDP's response shall be not used as a reason for extending the deadline for submission, unless UNDP determines that such an extension is necessary and communicates a new deadline to the Bidders**.
11.	Language	All bids, information, documents, and correspondence exchanged between English and the bidders in relation to this bid process shall be in English
15.	Price adjustment	The price quoted by the Bidder shall not be subject to adjustment during the performance of the contract.
15.	Partial bids (lots)	Not allowed.
16.	Bid currencies	Prices shall be quoted in **United States Dollar.** Note: The VAT will be paid in LBP based on the Government circular regarding the VAT**.**
17.	Duties and taxes	All prices shall:

		Be inclusive of VAT and other applicable indirect taxes.
18.	Bid validity period	120 days
19.	Bid security	Not Required
22.	Alternative bids	Shall not be considered.
23.	Pre-bid conference	Will not be conducted Quantum webinar for suppliers is available in the following link: https://www.undp.org/procurement/business/resources-for-bidders. Bidders are strongly recommended to watch the webinar carefully.
24.	Site inspection	A group site inspection will be held An optional site visit will be scheduled by UNDP on **Tuesday 16 January 2024 at 10:00** a.m. Beirut Local Time to the site and announced to the interested bidders; Interested bidders should confirm their attendance including the name of one (1) representative only by email on or before **Monday 15 January 2024** to the following contact details: Name: Mr. Wassef Kodeih Email: wassef.kodeih@undp.org Site Location: Tayyebat, Insariyeh Lebanon Map: https://maps.app.goo.gl/1977EpxoDwsQV6MV9 The Bidder is responsible to identify special site characteristics including but not limited to soil conditions and site accessibility, even in the absence of an indication in this ITB of any special characteristic of the site or the works. Bidder is solely responsible for assessing and analysing the scope of work requested using Bidder's own means. UNDP will not accept any claim whatsoever by the contractor in relation to lack of awareness of the site conditions and its surroundings.
28.	Instruction for bid submission	Bidders must submit their bid directly in the online system. I. File Format: Click or tap here to enter text. II. All files must be free of viruses and not corrupted. III. Documents which are required in original (e.g. bid security) should be sent to the below address with a PDF copy submitted as part of the electronic submission: IV. It is recommended that bidders organize and name the files according the requirements and structure of the bid to facilitate their review. V. The bidder should receive an email acknowledging email receipt from the system.
29.	Deadline for bid submission	Deadline is indicated in the supplier portal. In case of discrepancies between the deadline indicated in the portal and deadline indicated elsewhere, the deadline in the portal will prevail. It is the responsibility of the bidder to be informed on the tender deadline.
32.	Bid opening	☐ Public bid opening will not be held ☒ A Public bid opening report will be sent automatically from the system to all

		bidders who have submitted a bid for this tender.
	Expected date for commencement of contract	01 March 2024
47.	Right to vary requirement at time of award	The maximum percentage by which quantities may be increased or decreased is 25%
	Contract award to one or more bidder	UNDP will award a contract to: One Bidder Only
50.	Type of contract to be awarded	Civil Works See Section 6: for sample contract. http://www.undp.org/content/undp/en/home/procurement/business/how-we-buy.html
50.	Conditions of contract to apply	UNDP General Terms and Conditions for Works See Section 6 http://www.undp.org/content/undp/en/home/procurement/business/how-we-buy.html
52.	Performance security	Required in the amount of 10% The performance security will be in the same currency as stipulated in Article 16: Bid currencies. The Performance Security shall be in the form of a Bank Guarantee as set out in Section 6 for template The performance security will be released 30 days after completion of defect liability period (2 years)
53.	Advance payment	Not Allowed
54.	Liquidated Damages	Will be imposed as follows: Percentage of contract price per week of delay: 0.5% up to a maximum of 10% of the Contract value, after which UNDP may terminate the contract.
	Other information related to the ITB	**Liability Insurance:** Based on the clause 23.2 of the General Conditions of Contract for the Civil Works, the liability insurance coverage amount shall be up to **USD 650,000 per** each occurrence. Such insurance shall remain valid for the entire contract duration. **Important additional information for bidders:** 1. COVID-19 restrictions together with partial or full lockdown will not constitute to Force Majeure. 2. UNDP implements a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, unethical practices, and obstruction. UNDP is committed to preventing, identifying, and addressing all acts of fraud and corrupt practices against UNDP as well as third parties involved in UNDP activities. (See http://www.undp.org/content/dam/undp/library/corporate/Transparency/UNDP_Anti_Fraud_Policy_English_FINAL_june_2011.pdf and https://www.undp.org/content/undp/en/home/procurement/business/

		protest-and-sanctions.html for full description of the policies) 3. UNDP implements a policy of zero tolerance on child labor. The Contractor represents and warrants that neither it, its parent entities (if any), nor any of the Contractor's subsidiary or affiliated entities (if any) is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child. Children shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. 4. UNDP implements a policy of zero tolerance on sexual exploitation. In the performance of the Contract, the Contractor shall comply with the Standards of Conduct set forth in the attached Secretary-General's bulletin ST/SGB/2003/13 of 9 October 2003, concerning "Special measures for protection from sexual exploitation and sexual abuse." In particular, the Contractor shall not engage in any conduct that would constitute sexual exploitation or sexual abuse, as defined in that bulletin. The Contractor shall take all appropriate measures to prevent sexual exploitation or abuse of anyone by its employees or any other persons engaged and controlled by the Contractor to perform any services under the Contract. ANTI-TERRORISM: The Contractor agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received under the Contract is used to provide support to individuals or entities associated with terrorism and that recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to Resolution 1267 (1999). The list can be accessed via https://www.un.org/sc/suborg/en/sanctions/1267/aq_sanctions_list. This provision must be included in all sub-contracts or sub-agreements entered into under the Contract. **Memo to Bidders (Examples of Bid Rejection):** Bids have been rejected at the submission stage or found to be technically noncompliant due to errors in presentation and failure to follow bidding instructions. Below are some of the more common examples of why bids are rejected. Bidders are urged to read this before submission and to check that their bids conform to each of these points and the instructions as noted in the bidding documents. 1. Bid is not signed as per the instructions in the ITB. 2. Not all sufficient documents have been provided. 3. Documents provided are not in English. Certificates of company registration or tax authorities may be presented in the original language. During the evaluation process UNDP may ask for translated files of such documents. 4. The work methodology is not well elaborated and aligned with the scope of work attached to the ITB and does not allow UNDP to assess in detail the technical approach of how the contractor will implement the works. 5. Documents provided do not directly address each point of the evaluation criteria. For proper evaluation, it is best practice to fill in the technical information directly into the Form E: Format of Technical Bid to allow the evaluation of the following sections:

		SECTION 1: Bidder's qualification, capacity and expertise SECTION 2: Scope of Supply, Technical Specifications, and Related Services SECTION 3: Management Structure and Key Personnel Additional submitted documents may be helpful for review of the bid, but it is expected that the sections of the Returnable Forms are properly filled to allow a structured review of the bid. 6. Bid not specifically addressing the evaluation criteria of the ITB and Technical Specifications. 7. Bid does not offer services which have been specifically requested in the Technical Specifications. 8. Failure to enclose the mandatory Bids Submission Form (see Section 6, Form A). 9. The Bidder failed to consult the UNDP Quantum eTendering website before the deadline for bid submission and did not see the changes to the ITB listed there which need to be incorporated in the bid. 10. The Bidder declines or proposes a major deviation to UNDP General Conditions of Contract. 11. Bids contain viruses and/or corrupted files. The Bidders should ensure that submitted bids DO NOT contain viruses and/or corrupted files. Such bids will be rejected. **Note: A bidder is required to submit a complete submission including all above mentioned documents. However, if a bidder does not submit the minimum mandatory document such (1) bid/quotation submission form (Form C) duly filled and signed, (2) bid security (if necessary), (3) JV agreement and Form E (if necessary), (4) construction work schedule, (5) labor work plan (document showing the created tasks of minimum work person-days and Job rotation, if needed & (6) duly filled BOQ as illustrated above, will not be considered for detailed technical evaluation.** The above examples illustrate some errors which may be made by Bidders. This is a partial list. The bidding documents contain additional instructions which should be followed carefully. **COVID-19 restrictions together with partial or full lockdown will not constitute to Force Majeure.**

SECTION 4: EVALUATION CRITERIA

- Non-discretionary "Pass" or "Fail" rating on the detailed contents of the Schedule of Requirements and Technical Specifications
- Lowest priced technically responsive, eligible and qualified bid.

Evaluation Criteria:

It will consist of 3 stages, namely stage of Eligibility; Preliminary Evaluation; and Bid Evaluation.

Stage 1: Eligibility:

- First, bids will be checked for their eligibility. If requested documents are not available with the bids, the bid will be disqualified at the stage of eligibility check.

Stage 2: Preliminary evaluation:

The following document will be reviewed:

- Certificate of Incorporation/ Business Registration/ Tax Registration;
- Company profile;
- Bid Submission Form, completed and signed;
- Document establishing and evidencing working experience in the field relevant to this ITB;
- List of similar contracts in nature, complexity and value over the past 10 years (mentioning client, year, area, budget, type of works, etc.);
- List of ongoing contracts with completion ratio (mentioning client, year, area, budget, type of works, etc.);
- Satisfactory completion letter from previous clients;
- Full acceptance of the Contract General Terms and Conditions;
- Quality Certificates (ISO, etc.).if available
- Data sheet of materials that will be used with the ITB requirements; (Highlight of the proposed materials in the datasheet) including Catalogues, Pictures and detailed Technical Specifications of the offered items;
- Latest Audited Financial Statement (Income statement and Balance Sheet) including independent Auditor's report for the last three years (2020, 2021 and 2022);
- Available liquid assets, lines of credit, bank certificate, credit facility or other proof of financial means issued within one (1) month maximum prior to bid's posting date;
- Statement indicating that the supplied installations shall be covered under a defect's liability (parts and labour) for a minimum period of **24 months** from the date of commissioning.
- Construction Work Schedule for the Project. The requested schedule (PDF and editable versions) shall clearly be linked to the assigned resources and technical requirements described in the scope work. Such work plan is substantial for the evaluation of bids. Furthermore, during contract implementation, the work plan shall help the contractor to clearly distribute the tasks and to minimize delays in delivery. Not meeting targeted delivery dates will lead to penalties and negative performance evaluations;
- Submission of an Environmental Management Plan (EMP). Bidder is requested to develop and submit a practical EMP that assures compliance with national regulations, HSE requirements, and international guidelines and Codes of Best Practices. The EMP shall include a list of mitigation and management measures, monitoring activities, procedures, practices, and protocols to be adopted by the Contractor during the Construction phase to avoid, reduce, mitigate or compensate for adverse environmental impacts and to minimize associated risks;
- Methodology/method statement, procedures including timeframe in line with project requirements to meet deliverables and specific to the site in question. The methodology shall be specific to the required project activities of this ITB and shall describe in sufficient details all the tasks included in the project execution from planning and mobilization to hand over, in addition to possible subcontracting, environmental, health and safety, security, and protection application, including COVID-19 protection related measures. The methodology should reflect the project's specific environment whereby collected data shall be used properly in the bid preparation. The methodology should be linked to the submitted work plan and should describe all activities required under the Scope of Work in the correct sequence and

in line with engineering practices. The methodology shall include a paragraph, describing in details the specific site characteristics such as but not limited to, soil conditions and access routes to works sites, and proving that the bidder is fully aware of the site conditions and has examined the site, and its surroundings where the Works are to be executed and has obtained all information that may be necessary for preparing the Bid and entering into a contract for construction of the specified works under this ITB. Any method statement missing the above-mentioned requirements, and not linked to the work plan, missing any required activity, or not presenting the correct activities sequence will lead to disqualifying the bidder during the evaluation. In addition, the methodology shall elaborate safety plan, detailed plan on a, confirmation of ability to generate full shop drawings and final as built drawings for the executed works, confirmation of ability to provide detailed schedules using specialized planning software (Primavera) and confirmation of availability of the necessary engineering software.

- CVs of the Engineers, and other technical staff proposed to be deployed to the project;
- **Price Schedule, Inventory Table and Priced BOQ, completed and signed**;
- Joint Venture (JV) Certificate or confirmation to establish JV in the case where two or more companies apply to single bid;
- Manufacturer authorization letters;
- BOQ (Excel sheets) complete: Summary and detailed BOQ and inventory sheet

<u>Stage 3:</u> Bid Evaluation Criteria:

- Minimum of 8 years of experience in Solar PV installation systems (Hybrid PV – Diesel, On-grid Solar PV, Off-grid Solar PV). Note: Solar Street Lighting and Solar pumping and Lead-Acid batteries will NOT be taken into account;
- Satisfactory completion letter from previous clients for minimum three different projects similar in nature related to at least 3 completed Hybrid PV projects of a minimum 100 kWp capacity (per system) and similar projects implemented and completed and commissioned in Lebanon or in any country with a minimum cumulative contract value of 500,000 USD, commissioned in Lebanon or in the region at the time of bidding over the past 10 years; Note: Solar Street Lighting and Solar pumping will NOT be taken into account
- Full acceptance of the Contract General Terms and Conditions;
- Full compliance of Bid to the Technical requirements inventory of equipment and BOQ (summary and detailed)and in line with site specific characteristics ;
- Sound and good standing of financial status: (minimum average acceptable Quick Ratio 1.0) within the last 3 (three) years (2020, 2021 and 2022);
- Minimum average annual contract turnover of USD 650,000 (Six Hundred Fifty Thousand USD) calculated as total certified payments received for contracts in progress or completed, within the last 3 (three) years (2020, 2021 and 2022);
- Available liquid assets, lines of credit, bank certificate, credit facility or other proof of financial means, **issued within one (1) month maximum prior to bid's posting date**, equivalent to the financial offer of the bidder;
- Compliance of data sheet of materials that will be used with the ITB requirements;
- Compliance of Operation & Maintenance manual ;
- Suitability of Construction Work Schedule;
- Compliance of an Environmental Management Plan (EMP) to the requirements;
- Compliance of methodology/method statement to the requirements;
- Suitability and technical qualification of the technical personnel proposed to the project in relation to their qualification and years of experiences. Number of personnel in line with requirements:

CVs of the Key Staff. The key staff shall be on site full-time, and this should be confirmed in the bid otherwise the bidder will be disqualified. The availability of the required staff on site is mandatory and none of the proposed staff/team members shall be assigned during contract implementation to another project. Bidders are reminded that the submission of the key personnel is a mandatory criterion, and that the deployment of the proposed and accepted personnel is mandatory:

Project Manager:

- A bachelor's degree in electrical / Mechanical engineering or related field;
- Minimum 8 years of experience in PV design and installation (Off grid and Hybrid Systems)
- Previous experience in at least 5 similar projects in PV design and installation (Off grid and Hybrid – at least one of each should be provided)

Energy Engineer:

- A bachelor's degree in electrical / Mechanical engineering or related field;
- Minimum 5 years of experience in in PV design and installation (Off grid and Hybrid Systems)
- Previous experience in at least 3 similar projects in PV design and installation (Off grid and Hybrid – at least one of each should be provided)

Technician/skilled worker:

- Minimum 8 years of experience
- Previous experience in PV installation projects (Off grid and Hybrid Systems – 5 projects).

An organogram shall be submitted showing the role of each personnel in the structure of the project.

**: list of projects should be submitted clearly stating (project name, type of project, project capacity, role / work on the project and completion date)*

- Compliance of inventory table detailing the capacities and quantities of quoted equipment;
- Manufacturers guaranties:
  - PV Modules: overall 25 years of which 10 years on material and manufacturing faults and 25 years 80% power output warranty.
  - Grid-tied inverter: 5 years
  - Fuel-save controller: 2 years
  - Mounting structures and accessories:
  - Roof-mounted structures: 10 years' product warranty from manufacturer.
  - Elevated structure: 2 years
- Statement of warranty of defects in material and workpersonship backed by the manufacturer/supplier guarantee meet or exceed 24 months;

Note: A bidder is required to submit a complete submission including all above mentioned documents. However, if a bidder does not submit the minimum mandatory document such (1) bid submission form (Annex A) duly filled and signed, (2) bid security (if necessary), (3) JV agreement and Form C (if necessary), (4) construction work schedule as illustrated above, will not be considered for detailed technical evaluation, (5) labor work plan (document showing the created tasks of minimum work person-days and Job rotation, if needed & (6) duly filled BOQ as illustrated above, will not be considered for detailed technical evaluation.

Information to be provided in the relevant Forms:

Criteria	Documents to establish compliance
Completeness of the bid	All documents and technical documentation requested in Section 2: Instructions to Bidders Article 12 have been provided and are complete **Note: A bidder is required to submit a complete submission including all above mentioned documents. However, if a bidder does not submit the minimum mandatory document such (1) bid/quotation submission form (Form C) duly filled and signed, (2) bid security (if necessary), (3) JV agreement and Form E (if necessary), (4) construction work schedule, (5) labor work plan (document showing the created tasks of minimum work person-days and Job rotation, if needed & (6) duly filled BOQ as illustrated above, will not be considered for detailed technical evaluation.**
Bidder accepts UNDP General Conditions of Contract as specified in Section 6.	Form C: Bid Submission
Bid Validity	Form C
Bid Security with compliant validity period	Not Applicable
Appropriate signatures	Required
Power of Attorney	Required
Bidder is a legally registered entity	Form D: Bidder Information
Bidder belongs to a diverse supplier group including micro, small or medium sized enterprise, women or youth owned business or other.	Form D: Bidder Information
Vendor is not suspended, nor otherwise identified as ineligible by any UN Organization, the World Bank Group or any other International Organisation in accordance with Section 2 Article 4.	Form C: Bid Submission
No conflicts of interest in accordance with Section 2 Article 4.	Form C: Bid Submission
The bidder has not declared bankruptcy, in not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against the vendor that could impair its operations in the foreseeable future	Form C: Bid Submission
Certificates and Licences: ▪ Duly authorized to act as Agent on behalf of the Manufacturer, or Power of Attorney, if bidder is not a manufacturer. ▪ Official appointment as local representative, if bidder is submitting a bid on behalf of an entity located outside the country. ▪ Patent Registration Certificates, if any of technologies submitted in the bid is patented by the bidder. ▪ Export/Import Licenses, if applicable. ▪ Proof that the Bidder has ISO 9001 quality management certificates (or equivalent) among other compliant certificates (if	Form D: Bidder Information

available)	
History of non-performing contracts[1]: Non-performance of a contract did not occur as a result of contractor default within the last 3 years.	Form F: Eligibility and Qualification Form
Litigation History: No consistent history of court/arbitral award decisions against the bidder for the last 3 years.	Form F: Eligibility and Qualification Form
Previous Experience as indicated above	Form F: Eligibility and Qualification Form
Financial Standing as indicated above	Copy of audited financial statements for the last three years. / Form F: Eligibility and Qualification Form
Goods/works/services offered in the bid are substantially compliant and do not contain any material deviation(s) from the minimum required as included in Section 5: Schedule of Requirements	Form G: Technical Bid
The bid is substantially compliant with the minimum Delivery Requirements included in Section 5: Schedule of Requirements and do not contain any material deviation(s)	Form G: Technical Bid Form H: Price Schedule
Sustainability of work schedule as indicated above	Work plan
Compliance of data sheet of materials as indicated above	Data sheet
Compliance of Testing reports from certified third body	Form G: Technical Bid
Suitability and technical qualification of the technical personnel as indicated above	CVs and organigramme
Methodology/method statement as indicated above	Method statement
Manufacturers guaranties as indicated above	Manufacturers guaranties
Price comparison shall be based on the landed price, including transportation, insurance and the total cost of ownership (including spare parts, consumption, installation, commissioning, training, special packaging, etc., where applicable) and Inventory table detailing the capacities and quantities of quoted equipment (refer to project BOQ)	Form H: Price Schedule

Note: For JV/Consortium/Association, all Parties cumulatively should meet requirement. Sub-contractor qualifications will not be taken into consideration for evaluation.

[1] Non-performance, as decided by UNDP, shall include all contracts where (a) non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non-performance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

Section 5a: Schedule of Requirements and Technical Specifications/Bill of Quantities/SOW

Supply, Installation, Commissioning, and Provision of Operation and Maintenance Support of a Hybrid Solar PV diesel System at TAYYEBAT facility in Insariyeh, South Lebanon, Lebanon

I. Objective

The objective of this ITB is the "Supply, Installation, Commissioning, and Provision of Operation and Maintenance Support of Hybrid Solar PV-diesel System at TAYYEBAT facility, Lebanon" consisting of PV generators, grid tied inverters, Fuel Save PV controller, Data Loggers, Mounting Structures (Elevated and on Corrugated Sheet Roof), with all necessary auxiliary equipment at TAYYEBAT facility, complete with the provision of training and documentation on the operation and maintenance of the installed plants and provision of support for Operation and Maintenance for 2 years with spare parts.

Within the context of the project "Supply, Installation, Commissioning, and Provision of Operation and Maintenance Support of a Hybrid Solar PV diesel System at TAYYEBAT facility in Insariyeh, South Lebanon, Lebanon", executed by the United Nations Development Programme (UNDP), the Lebanon Country Office wishes to contract the services of a company to execute all works related to the supply, delivery, installation, commissioning, operation and maintenance complete with the provision of O&M documentation and training to facility maintenance personnel.

II. Background

The United Nations Development Programme, in support of the Ministry of Energy and Water, has initiated the implementation of the CEDRO 5 project, co-funded by the European Union. The CEDRO 5 project is implemented in partnership with the Association of Lebanese Industrialists (ALI), The Lebanon Green Building Council (LGBC), and the International Renewable Energy Credits (I-REC) Institution.

The European Commission (EC) is encouraging innovation and entrepreneurship in Lebanon to support a clean energy transition. The overall aim of the EC is to address job creation and growth in support of Lebanon's economy, in line with the priority sector of the Single Support Framework for EU Support to Lebanon (2017-2020), while supporting Climate Change Mitigation in Lebanon. The specific objective is to promote innovation, entrepreneurship, and job creation in support of Lebanon's clean energy transition and Nationally Determined Contributions (NDCs) for the energy sector. The EC proposes the gradual shift towards a clean energy transition (gradual phasing out from fossil fuels by switching to renewable energy sources)and circular economy principles, paving the way for (1) tapping into the potential for green jobs and growth (in particular in the energy sector), (2) alleviating financial and economic burden of the current energy system on the various sectors and sub-sectors of Lebanon, (3) facilitating access to financing, and (4) improving the linkages amongst green entrepreneurship, small-and-medium sized enterprises (SMEs), industries and research/technology centers.

The CEDRO 5 project aims to achieve the above outlined objectives through enhancing innovation, entrepreneurship, and research, assisting in technology transfer and the creation of new value chains in the renewable energy and energy efficiency sector, supporting and initiating enabling policy, training and capacity building, and targeting effective awareness initiatives on renewable energy (RE) and energy efficiency (EE).

III. Glossary of Terms

Solar photovoltaic components	
Crystalline silicon	A general category of silicon materials exhibiting a crystalline structure. Symbol: c-Si. (also single crystalline sc-Si and multi-crystalline mc-Si).
Photovoltaic module or panel	The smallest complete environmentally protected assembly of interconnected cells. Colloquially referred to as a "solar module".
Photovoltaic cell	The basic photovoltaic device. Colloquially referred to as a "solar cell".
Reference cell	A specially calibrated cell that is used to measure irradiance.
Rated capacity STC	The PV module power delivered at the maximum power point at standard test conditions (STC).

Hot spot	The intense, localized heating of a spot on a cell in a module where a breakdown of the junction on that cell has occurred due to an excessively high reverse voltage bias or by some damage. This creates a small, localized shunt path through which a large portion of the module current flows.
Bypass diode (on a module level)	A diode connected across one or more cells in the forward current direction to allow the module current to bypass cells to prevent hot spot or hot cell damage resulting from the reverse voltage biasing from the other cells in that module.
DC converter	An electronic component that changes the generator output voltage into a useable DC voltage.
Maximum power point tracking	A control strategy for DC converters and PV inverters whereby the PV generator operation is always near the point of current-voltage characteristic where the product of current and voltage yields the maximum electrical power under the operating conditions. Abbreviation: MPPT.
Inverter	A system component that converts DC electricity into AC electricity. One of the family of components that is included in "power conditioner".
String inverter	An inverter designed to operate with only one string of PV modules. The output in AC can be connected in parallel with other similar inverters.
Multi-string inverter	An inverter designed to operate with more than one string of PV modules. The output in AC . can be connected in parallel with other similar inverters.
Grid-connected inverter	An inverter that is able to operate in grid-parallel with a utility supply authority.
Grid-tied inverter	An inverter that can only operate in grid-parallel with an AC electric grid. Also known as a grid-tied inverter.
Dual mode inverter	A type of inverter that is able to operate in both autonomous and grid-parallel modes according to the availability of the utility supply authority. This type of inverter initiates autonomous operation.
Autonomous inverter	An inverter that supplies a load not connected to an electric utility. Also known as a "battery- powered inverter" or "stand-alone inverter"
Voltage control inverter	An inverter with an output voltage that is a specified sine wave produced by pulse-width modulated (PWM) control etc.
Current control inverter	An inverter with an output current that is a specified sine wave produced by pulse-width modulated (PWM) control etc.
Junction box	An enclosure in which circuits are electrically connected and where protection devices can be located.
Generator junction box	A junction box in which the photovoltaic module circuits are electrically connected and where string protection devices are located.
Utility interface disconnect switch	A switch at the interface between the photovoltaic system and the utility grid.
Storage	Accumulation of electricity in a non-electric form and which can be reconverted through the system to electricity.
Lithium ion battery	A lithium-ion (Li-ion) battery is an advanced battery technology that uses lithium ions as a key component of its electrochemistry
BMS	A battery management system (BMS) is any electronic system that manages a rechargeable battery (cell or battery pack), such as by protecting the battery from operating outside its safe operating area, monitoring its state, calculating secondary data, reporting that data, controlling its environment, authenticating it and / or balancing it
Solar photovoltaic power plants	
Distributed generation plant	The facility and equipment comprising an electricity generation plant that is interconnected to and operates in parallel with a distribution system.
Distribution system	An electrical facility and its components including poles, transformers, disconnects, isolators and wires that are operated by an electric utility to distribute electrical energy from substations to customers. Also referred to as electric grid.
Electric utility	The organization responsible for the installation, operation and maintenance of all or some portions

	of major electric generation, transmission, and distribution systems.
Energy and Management System	Component with the objective of ensuring the proper management of the power plant (EMS)
Genset	A colloquial term meaning “engine-generator set” consisting of an engine coupled to a rotating electric generator.
Individual electrification plant	A small electric generating system that supplies electricity to one consumption point usually from a single energy source.
Interconnection	the result of the process of electrically connecting a distributed generation plant to a distribution system in order to enable the two systems to operate in parallel with each other.
Autonomous operation	The operating mode in which loads are electrified solely by the PV plant and not in parallel with the utility. Also known as stand-alone or off-grid.
Grid-connected operation	The operating mode in which a PV plant is operating in parallel with an electric grid. Site loads will be electrified by either or both the utility or the plant. Electricity will be able to flow into the grid if the utility permits back feed operation. In the case of the present ITB, grid connected operation will have a third possible source: on-site diesel generators
Photovoltaic generator	A mechanically integrated assembly of modules or panels and its support structure that forms an electricity producing sub-system. This does not include energy storage devices or power conditioners. Also known as array.
Photovoltaic string	A circuit of series-connected modules.
Photovoltaic plant	A photovoltaic generator and other components that generate and supply electricity suitable for the intended application. The component list and system configuration varies according to the application, and could also include: power conditioning, storage, system monitoring and control and utility grid interface. Also known as a photovoltaic system. Some such plants are grid-connected and large and others can also be small (micro plants), off-grid or even diesel grid connected. The following terms describe common system configurations.
Hybrid photovoltaic plant	In this ITB; it is referred to a plant with: Grid, RE (this case PV) plant and Diesel generator
Multi-source photovoltaic plant	A power plant with photovoltaic generation operating in parallel with other electricity generators. In this ITB it could refer to “Dual mode” “Off-grid” and "hybrid" system as all three have more than one source. Kindly refer to the function configuration section for more details
Site	The geographical location of a plant.
Sub-system	An assembly of components. The following terms describe common subsystems.
Photovoltaic generator sub- system	The components that convert light energy into electricity using the photovoltaic effect.
Power conditioning sub-system	The component(s) that convert(s) electricity from one form into another form that is suitable for the intended application. Such a sub-system could include the charge controller that converts DC. to DC., the inverter that converts DC. to AC., or the charger or rectifier that converts AC. to DC.
Storage sub-system	The component(s) that store(s) energy.
Monitor and control sub- system	The logic and control component(s) that supervise(s) the overall operation of the plant by controlling the interaction between all sub-systems.
Safety disconnect sub- system	The component(s) that monitor(s) utility grid conditions and open(s) a safety disconnect for out-of- bound conditions.
Data logging and evaluation sub-system	The measurement and logic component(s) that register and process all relevant operational parameters and data of the plant to establish the daily, monthly and annual final yields, losses and performance of the subsystems.
Solar photovoltaic plant performance parameters	
Standard test conditions (STC)	Reference values of in-plane irradiance (GI,ref = 1 000 W.m-2), air temperature (25°C), and air mass (AM = 1,5) to be used during the testing of any photovoltaic device. Abbreviation: STC.

Voltage of a photovoltaic generator	the PV generator voltage is considered to be equal to open circuit voltage under worst case conditions.
Open circuit voltage of a photovoltaic generator	The open circuit voltage at STC of a PV generator, and is equal to: VOC pvg = VOC MOD X M ,where M is the number of series-connected PV modules in any PV string of the generator. . Abbreviation: VOC pvg.
Short circuit current of a photovoltaic generator	the short circuit current at STC of a PV generator, and is equal to: ISC pvg = ISC STC MOD X Sg, where Sg is the total number of parallel-connected strings in the PV generator.
Load	An electrical component that converts electricity into a form of useful energy and only operates when voltage is applied.
Performance ratio	The overall effect of losses on an array's rated output due to array temperature, incomplete utilization of the irradiation, and system component inefficiencies or failures. Commonly found by the quotient of the final system yield over the reference yield. Symbol: PR
Yield	The equivalent amount of time that a plant would need to operate at its rated capacity at STC in order to generate the same amount of energy that it actually did generate. A yield indicates actual device or system operation normalized to its rated capacity.
Reference yield	The amount of time that the irradiance would need to be at reference irradiance levels to contribute the same incident irradiation as actually occurred. It is calculated from the quotient of the total irradiation over the reference irradiance. Symbol: Yr. NOTE: If GI,ref = 1 kW·m−2 then the irradiation
	as expressed in kWh·m-2 over any period of time is numerically equal to energy as expressed in kWh·kW-1 over that same period. Thus Yr would be, in effect, "peak sun-hours" over that same period.
Final plant yield	The net energy that was supplied during a given period of time by the photovoltaic generator normalized to its rated PV capacity. Symbol: Yf.
Final annual yield	The total photovoltaic energy delivered to the load during one year per unit of installed PV capacity.
Losses	The electrical power or energy that does not result in the service that is intended for the electricity.
Normalized losses	The amount of time that a device or system would need to operate at its rated capacity in order to provide for system energy losses. These are commonly calculated from a difference in yields.
Plant rated power	Pertaining to PV autonomous plants: The power generated when connected to a rated load. Pertaining to PV grid-connected plants: The power that can be injected under standard operating conditions.
Generator rated capacity	The rated power generation of a photovoltaic generator, usually at STC.
Generator yield	The photovoltaic energy generated per unit of installed generator capacity. Also referred to as array yield. Symbol: Ya.
PV generator capture losses	The normalized losses due to photovoltaic generator operation, found by the difference between the reference yield and the generator yield. It includes mismatch losses, temperature effect and non dispatchable yield. Symbol: Lc.
Module mismatch loss	The difference between the total maximum power of devices connected in series or parallel and the sum of each device measured separately under the same conditions. This arises because of differences in individual device I-V characteristics. Units: W or dimensionless expressed normalized.
Efficiency	The ratio of output quantity over input quantity. The quantity specified is normally the power, energy, or electric charge produced by and delivered to a component. Symbol: η is commonly used. Units: dimensionless, usually expressed as a percentage (%).
Rated efficiency	Pertaining to a device: The efficiency of a device at specified operating conditions, usually standard test conditions (STC).Pertaining to an inverter: The efficiency of an inverter when it is operating at its rated output.
Power efficiency	The ratio of active output power to active input power.

Partial load efficiency	The ratio of the effective inverter output power to its input power at a specified load.
Weighted averag e conversion efficiency	A method of estimating the effective energy efficiency. It is calculated as the sum of products of each power level efficiency and related weighting coefficients depend on a regional irradiance duration curve. When the plant is an autonomous type with a storage subsystem, the weighting coefficients depend on the load duration curve.
Storage rated capacity	The energy (or charge) that can be withdrawn from the storage device under specified discharge rate (time) and temperature conditions.
Residual capacity	The charge or energy capacity remaining in an electrical storage device following a partial discharge.
State of charge	The ratio between the residual capacity and the rated capacity of a storage device. Abbreviation: SOC. Units: dimensionless, usually expressed as a percentage (%).
Partial state of charge	A state indicating that an electrical storage device has not reached a full charge. Abbreviation: PSOC. Units: dimensionless, usually expressed as a percentage (%).
Depth of discharge	A value to express the discharge of an electrical storage device. The ratio of the discharge amount to the rated capacity is generally used. Abbreviation: DOD. Units: dimensionless, usually expressed as a percentage (%).
Charging efficiency	A generic term to express ampere-hour efficiency (or less commonly, watt-hour efficiency).
Ampere-hour efficiency	The ratio of the amount of electrical charge removed during discharge conditions to the amount of electrical charge added during charge conditions in an electrical storage device.
Watt-hour efficiency	The ratio of the amount of electrical energy removed during discharge conditions to the amount of electrical energy added during charge conditions in an electrical storage device.
Inverter rated power	The power that can be supplied by the inverter at 25 ºC. In grid-connected mode it refers to a continuous operating condition, in autonomous mode it usually refers to a 30’ surge.
Inverter efficiency	The ratio of the useful inverter output to its input.
Overload capability	Output power level beyond which permanent damage occurs to a device or system. It is expressed by the ratio of overload power to rated load power for a period of time. Units: dimensionless (usually expressed as a percentage, %), and minutes.
No load loss	Input power of the converter when its load is disconnected and output voltage is present.
Standby loss	The power drawn by a power conditioner when it is in standby mode. Units: W. Pertaining to stand-alone power conditioners: The DC. input power. Pertaining to grid-connected power conditioners: The power drawn from the utility grid.
Environmental parameters	
Ambient temperature	The temperature of the air surrounding a PV generator as measured in a vented enclosure and shielded from solar. Symbol: Tamb. Unit: °C.
Angle of incidence	The angle between the direct irradiant beam and the normal to the active surface.
Azimuth angle	The projected angle between a straight line from the apparent position of the sun to the point of observation and a horizontal line normal to the equator. This is measured from due north in the southern hemisphere and from due south in the northern hemisphere. Negative azimuth values indicate an eastern orientation and positive values a western orientation. Symbol: α.
Solar elevation angle	The angle between the direct solar beam and the horizontal plane. Symbol: θ.
Tilt angle	The angle between the horizontal plane and the plane of the module surface.
Irradiance	Electromagnetic radiated power incident upon a surface, most commonly from the sun or a solar simulator. Symbol: G. Unit: W·m-2.
Global irradiance	Irradiance on a horizontal surface. This equals horizontal direct irradiance plus horizontal diffuse irradiance.
In-plane irradiance	Total irradiance on the plane of a device. Symbol: GI.
Solar energy	Common term meaning irradiation.
Irradiation	Irradiance integrated over a specified time interval. Symbol: H. Unit: J·m-2.]
Testing and certification	
Inspection	Evaluation for conformity by measuring, observing, testing, or gauging the relevant characteristics as required by the technical specifications.

Tests	Technical operations to establish of one or more characteristics of a given product or service according to a specified procedure.
Acceptance testing	Site-specific testing to assure acceptable performance in accordance with IEC 62446-1 (or equivalent)
Verification	Confirmation by examination and recording of physical evidence that specified requirements have been met.
Verification testing	Site-specific, periodic testing to assure continued acceptable performance.
Certificate of conformity	A label, nameplate, or document of specified form and content, directly associated with a product or service on delivery to the purchaser, attesting that the product or service is in conformity with the requirements of the certification program (e.g., with the referenced standards and specifications).
Miscellaneous	
Electromagne tic interference	The condition where electromagnetic energy interferes with the proper operation of equipment. Abbreviation: EMI.
Fuel Reduction Mode	Mode of operation when the PV plant works in parallel to the diesel genset with the objective of reducing the fuel consumption
Total harmonic distortion	The ratio of effective signal of total harmonic to effective signal of basic frequency. Units: dimensionless, usually expressed as a percentage (%).
Safe extra low voltage (SELV)	An extra-low voltage system which is electrically separated from earth and from other systems in such a way that a single fault cannot give rise to the risk of electric shock.
Extra-low voltage (ELV)	Voltage not exceeding not exceeding 50 V AC. and 120 V ripple free DC (a ripple content not exceeding 10% r.m.s). Some national standards consider 75 V DC as a maximum. In consideration of ELV status, VOC of the PV generator must be used
Low voltage.(LV)	Voltage exceeding extra-low voltage, but not exceeding 1 000 V AC. or 1 500 V DC.
High voltage (HV)	Voltage exceeding low voltage.
Class II equipment	Equipment in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions such as double insulation or reinforced insulation are provided, there being no provision for protective earthing or reliance upon installation conditions
Class III equipment	Equipment in which protection against electric shock relies on supply at SELV and in which voltages higher than those of SELV are not generated.
Double insulation	Insulation comprising both basic insulation and supplementary insulation.
Earthing	A protection against electric shocks.
ATS	Automatic transfer switch
MDB	Main Distribution Board
C/O	Change Over Switch
UG	Under Ground
PCC	Point of Common Coupling

IV. Scope of works

The works under this ITB consist of supplying all the components, installing, testing, commissioning, handing over in good operating conditions complete systems detailed herein with 2 years O&M, documentation, and training.

The contractor shall provide all necessary components, except otherwise specified, and accessories as well as manpower, scaffolding, civil works, machines, etc at the Contractor's own expense to install complete operational devices.

The equipment furnished to these specifications must meet or exceed all requirements herein and in the attached technical drawings (SLD and site layout drawings).. Modifications of or additions to basic standard equipment of less size or capability to meet these requirements will not be acceptable.

The bidders are invited to read the specifications carefully, as there may be special requirements not commonly offered by all manufacturers. Nevertheless, the technical specifications presented herein are not to be interpreted as necessarily defining a particular manufacturer's product, model or features. The equipment shall conform in capability, strength, quality and workmanship to the accepted industry standards and relevant international quality standards.

It should be noted that the equipment offered should be suitable for operation at 220V-240V (1-phase) & 380V-400V (3-phase), 50 Hz and there may be voltage sags and voltage surges from the utility grid side.

Table 1 below details the required work in the facility.

Note: The below cable routing and distances listed in Table 1 are preliminary and approximate. It is the contractor's responsibility to check for suitable routing and get exact measurements of the distances in addition to the distances between the generators and the fuel save controllers. The contractor is required to install a circuit breaker and a contactor near the PCC for protection and control. Routing of the cables and the distance measurement from the PV modules or the AC combiner box to the PCC and the control and measurements between the generators and the fuel save controller are of the contractor's sole responsibility.

Inverters to be submitted are **50kW or above** to make up the total required facility capacity as mentioned in Table 1 below. The Maximum acceptable **DC/AC ratio is 1.1** and PV inverters must be of same brand.

Table 1: Required Works

Facility	Minimum PV (kWp)	PV System type	Minimum Inverter (min. continuous kW @ T=25°C)	Mounting type	PCC location	Tilt Angle
PV-Section 1	27.36	Hybrid: (On-grid, diesel)	Minimum total capacity of 400 KW on-grid inverter to be installed With Min. 50 KW per inverter	Elevated structure **on existing Flat Roof with concrete pads.** Refer to the attached conceptual detail in Annex I - (Tayyebat-PV Layout)	Electrical room	10 º facing south
PV-Section 2	246.24			On Corrugated Sheet Roof **using Clamps** Refer to the attached conceptual detail in Annex I - (Tayyebat-PV Layout)	Electrical room	West- (Following the direction and inclination of the roof)
PV-Section 3	129.96			On Corrugated Sheet Roof **using Clamps** Refer to the attached conceptual detail in Annex I - (Tayyebat-PV Layout)	Electrical room	East- (Following the direction and inclination of the roof)

V. Reporting:

A. The contractor shall submit the following reports:

Weekly progress report (the template will be provided by the UNDP team at kick off meeting). This progress report shall include:

I. Photographic records
II. Complete works schedule and details
III. Upcoming week's schedule of works
IV. Update on shipment status

B. The Contractor shall review the detailed bill of quantities and submit a layout drawing, list of the required tools, accessories and labour force needed to complete the scope of work in the contract

VI. Sites Details

The works under this ITB will be completed for the above facility in Insariyeh in South Lebanon.

Environmental and Climatic Conditions

All equipment shall be fully operational in the following conditions:

- Relative humidity up to 95%
- Ambient temperature from -10ºC to 45ºC
- Urban and rural environment with moderate presence of dust, insects, etc.

External equipment shall additionally withstand the following conditions (*proof shall be submitted*):

High ultraviolet radiation

- Wind speed: 140 km/h Gust speed
  120 km/h continuous speed.

The ability of the equipment (equipment installed outdoor i.e. structures, panels, DC combiner box, cable trays, conduits etc..) of the same basic design and size to operate correctly in the indicated environmental and climatic conditions shall be proven by appropriate documentation on successful operation of at least 5 years.

Existing Power System

At the facility there are three synchronized generators in addition to the EDL connection. (For more details about generators and EDL please refer to Table 2 below and the respective SLDs).

Table 2: Facility information (electrical)

Generator size	Generators' operation	EDL capacity	MDB location	Earthing availability
G1: 500 kVA (3ϕ) VOLVO Controller: InteliLite NT AMF 9 G2: 500 kVA (3ϕ) VOLVO Controller: InteliLite NT AMF 9 G3: 500 kVA (3ϕ) SCANNY Controller: InteliLite NT MRS 4	Synchronizing and Load sharing	MV/LV 3 x 650 kVA Main transformer	Electrical room	Yes

Earthing System

The contractor shall test the resistance of the existing system; If it is less than 5 ohms, the photovoltaic system can be connected to it, and if not, the contractor must provide a new earthing system with a resistance value not exceeding 5 ohms. The Contractor shall verify that the earth connection to which all relevant components of the new installation are bonded, which will also protect the new distribution installation with differential switches.

The location of the earthing rods to be coordinated with UNDP and the beneficiary.

The Contractor shall connect the metallic chassis of all electronic equipment and PV structure with minimum 16 mm2 ground wire. The SPD (Surge Protection Device) shall also be grounded.

VII. Other Requirements

1- Functional Configuration

As indicated in Table 1 above, the designed system to be installed is Hybrid Solar PV-diesel with net metering.

Hybrid systems: as labelled under this ITB are systems that have: a functioning EDL (Electricité du Liban), a diesel generator network and the added renewable energy source (on-grid PV system with fuel save controller).

Modes of operation are described below so that the Contractor can fully recognize the objective of the PV system and have a complete view of the PV Power Plant.

The modes of operation have been defined looking at the type of power source that feeds it. There are two different grid forming power sources: the utility grid and the diesel generator.

Hybrid systems will feature the below requirements illustrated in Figure 1 below:

- It will be coupled at the main distribution board of the facility
- It should feature a fuel save controller to manage the operation of the system in parallel with the diesel generator and the grid
- The fuel save controller must be able to control the active and reactive energy from the PV inverters
- PV inverters should have the capacity to supply reactive power depending on the power factor without clipping active power production i.e oversizing the DC capacity per inverter is not accepted.
- The fuel save controller must monitor which power (Generator and Mains) source in connected to the load as well as which generator is on load
- Load measurement should be done on each power source (Gen and EDL)
- Export extra energy produced into the grid after a net meter is installed
- Before installing a net meter, there should be an option of zero feed-in into the grid where PV will have a set point to cover the whole load during grid operation
- The fuel save controller must curtail extra PV produced to maintain at least 20-25% load on the generator when running in parallel with the PV

It is the contractor's responsibility to assist the beneficiary (TAYYEBAT) in the net metering application and to follow – up on the application with EDL at least until the end of the performance guarantee period.

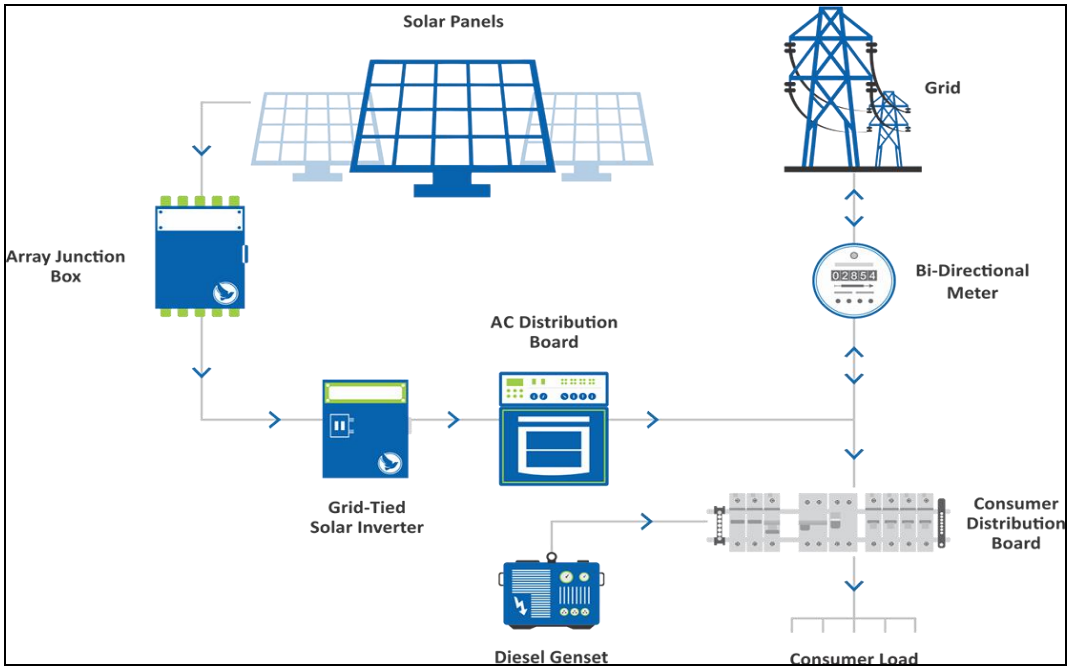

Figure 1: Hybrid System

The two distinctive operation modes are detailed hereafter:

Grid Mode:

When there is grid supply, the PV generator can reduce the consumption from the utility grid by parallel connection and offsetting the loads of the facility as well as potentially back-feeding surplus PV production into the grid. Net metering applications are to be submitted and followed up by the contractor for facilities with 'Hybrid' systems.

The PV systems should be set on "Zero Export Mode" until Net-Metering is installed in the facility where it should be set to "Grid managed mode" with no back-feeding to the generator subscription grid using PV fuel save controller.

Fuel Reduction Mode:

The Fuel Reduction Mode is automatically triggered when there is a grid black out and the Genset is ON. The Genset is started automatically when there is a shortage of grid supply for a transition Grid Mode to Fuel Reduction. The fuel save controller is required to synchronize the PV penetration while respecting the generators' minimum load capacity.

The system design should prevent the following risks from utility network or Genset network: Fault current, Voltage rise, Reverse Power Flow, Substation/Transformer loading, and potentially Neutral Voltage Displacement (NVD).

The fuel save controller should have the option to disconnect the PV plant at any time the load drops immediately to zero through a contactor installed at the output of the PV system near the PCC (point of common coupling).

If, during the Fuel Reduction Mode, the grid is available again, then the plant enters the Grid Mode automatically.

PV inverters must have fallback settings for active and reactive power. Fall back settings to be set to zero in the fastest time possible, in the absence of a communication signal from the fuel save controller. Also, in the absence of communication between the PV inverters and the fuel save controller, the main PV contactor must open to guarantee the safety of the system.

2- General Specifications

No construction works shall start at the selected sites until the workplan, submittals, shop drawings, deliverables manuals and technical specifications are prepared by the Contractor and approved by the UNDP.

Contractor must share a weekly progress report showing the works done with clear photos and a provisional schedule for the week after (Kindly refer to section V 'Reporting'). Contractor must abide by the technical requirements of this ITB and in parallel with international standards or manufacturer's recommendations.

The contractor must respect all other installations or systems existing at the facility near the place of his/her works. Any damage to other systems caused by the contractor will be fixed under his/her total expenses.

The works under this ITB consist of supplying all the systems' components, installing, testing, commissioning and handing over in good operating conditions in addition to complete O&M complete systems detailed in this ITB.

The installation works include the following equipment:

- PV Power Plant according to site specifications and equipment standards
- Earthing and protection equipment validation
- PV inverters rated outdoor and protected by shed from direct sunlight and rain
- Fuel save controller with all its accessories for proper and safe operation
- Cables with their mechanical and electrical protection (cables trays, conduits, circuit breakers etc..)
- Datalogging and system local and remote monitoring
- Independent LED screen for local monitoring
- UPS for the Fuel save controller and monitoring system
- All cable connections required to complete the system operation
- Cables crossing into the technical rooms or buildings to be inside pipes with a treatment to prevent any water leakage inside
- Clear Labelling of all cables (every 5 meters) and devices (inverters, protection devices etc..) where labels must match the as-built drawings. Labels installed outdoor should be UV resistant and weather proof
- Testing, Commissioning and Handing Over in good operation conditions with as-built drawings
- List of alarms and fault codes with possible troubleshooting information
- Training Manual and Training sessions on the installed equipment to the beneficiaries' staff maintenance crews.

The Contractor shall provide all necessary components, and accessories as well as human power, civil works, scaffolding, cranes etc, at the Contractor's own expense to install complete operational units.

The Contractor must pack the goods in a safe place that is not exposed to any external factors that may harm it, and he must keep clean the place on which the constructions are active during the installation stage until the site is delivered.

The PV power plants shall be installed at existing facility of the indicated beneficiary (TAYYEBAT) site and set to operate either with the facility diesel generators or EDL.

The equipment furnished to these specifications must meet or exceed all requirements herein and in the attached technical drawings (general SLD, solar PV SLD, and site layout drawings). Modifications of or additions to basic standard equipment of less size or capability to meet these requirements will not be acceptable.

Bidders are cautioned to read the specifications carefully, as there may be special requirements not commonly offered by all manufacturers. Nevertheless, the technical specifications presented herein are not to be interpreted as necessarily defining a particular manufacturer's product, model, or features. The equipment shall conform in capability, strength, quality, and workmanship to the accepted industry standards and relevant international quality standards.

It should be noted that the equipment offered should be suitable for operation at 380V-400V (3-phase), 50 Hz and there may be voltage sags and voltage surges from the utility grid side.

3- Technical Specifications

General Layout

The 'hybrid' power plant consists of PV generator including PV modules, PV inverter, mounting structure (Elevated and on Corrugated Sheet Roof), fuel save controller, and monitoring system. The local monitoring shall enable the beneficiary (TAYYEBAT) to check the source of power supplying the facility, flow of power, PV instantaneous power, and the hourly kWh generated by the system.

Mechanical design and exposure to environmental conditions

Support structures and mounting arrangements should comply with applicable building codes, regulations, and standards. Particular attention should be given to high corrosive environment, and wind and snow loads on the PV generators and their structures so that they withstand winds as required under section VI 'Sites details' (*proof shall be submitted*).

The fixation of panels shall be from manufacturer specialized in solar mounting structures

Roof-mounted (flat or tilted roof) structures shall be solar mounting structures from a manufacturer specialized in solar mounting structures. The elevated structure should match the requirements and specifications of this ITB. All the mounting structures' materials shall be corrosion-resistant, lightweight, aluminum or galvanized steel. The zinc coating should match a specification of 275g/m2 with supplier proof or certification. All accessories shall be corrosion resistant. The same applies to all bolts, nuts, guy wires, and fasteners. PV clamps to be used in between modules must be aluminum.

Care shall be taken to prevent electrochemical corrosion between dissimilar metals.

Provisions shall be made in order not to create electrochemical corrosion between the structures and the building on the one hand, and the structures and the photovoltaic modules on the other.

Outdoor generator wiring and associated components are exposed to UV, wind, water, and other environmental conditions. Wiring and components should be fit for this purpose and built in such a way as to minimize exposure to detrimental environmental effects (hot-dip galvanized covered cable trays, underground or rigid conduits). Particular attention is drawn to the need for prevention of water accumulation in cable/module supports.

For the 'hybrid' system, outdoor-rated PV inverters can be installed on the roof walls or PV structures with a shed for direct sunlight and rain.

Safety issues

- Protection against electric shock

Protection against electric shock in the DC. side shall be achieved by best practices and international standards together with components and systems classified as Class II or better.

For the AC side, protection by double or reinforced insulation between any live conductor and any earthed or exposed conductive part is required. For the PV inverters, the manufacturer shall advise on the type of differential circuit breaker to be used, to avoid nuisance tripping while ensuring protection against fire.

- Protection against fire

Direct current systems, and photovoltaic generators, in particular, pose various hazards in addition to those derived from conventional AC power systems, for example, the ability to produce and sustain electrical arcs with currents that are not much greater than normal operating currents. A fire-fighting extinguisher for electrical fires shall be provided near the equipment as close as possible to the door of the technical room from outside if possible.

- Rapid Shutdown Switch

The Rapid Shutdown system is composed of an emergency switch that will disconnect the whole PV system from the PCC. It can be installed to open the main contractor mentioned in the SLD. Also, the rapid shutdown switches to be installed near the emergency exit or near an emergency switch in the facility.

- Protection against over current

The PV inverter's cable over current protection shall be installed between the inverter's output inside the AC combiner box as indicated in the SLD and shall be selective with the PCC main circuit breaker to avoid this breaker of triggering in case of a fault occurring from the grid or the generator side on the inverter causing the full or partial shutdown of the facility.

PV generator protection against overcurrent is required in the strings: Fault currents due to short circuits in modules, in junction boxes or module wiring or earth faults in wiring can result in over-current in a PV generator. PV modules are current limited sources, but they can be subjected to overcurrent caused by either multiple parallel adjacent strings or from external sources or both. For this reason, over-current protection in each string is required if more than 2 strings are connected in parallel in a PV junction box or in the same MPPT entry of a PV inverter.

- Protection against effects of lightning and surge over-voltage

The protection level of the electric installations depends on many aspects like the type of installation, the proximity to the grid transformer, the possibility of a direct lightning strike etc.

The most important factors are described below:

- Electrical isolation material from the equipment.
- Overvoltage protection devices characteristics.
- Appropriated earthing system.

The overvoltage protection devices installed in the facility must follow the international standard IEC 61643-11. Additional measures are listed in the drawings.

- DC side:

Damage caused by over-voltage is ultimately due to the failure of insulation between live parts or between live parts and earth. Over-voltage protection intends to equalize all exposed metallic sections of an installation to a common potential during the event of an over-voltage. Equipotential bonding (and bonding each module frame) is therefore required as an important over-voltage protection measure and shall be done following recognized standards or acceptable state of the art procedures.

To avoid the formation of wiring loops between earthed conductors and DC cabling, equipotential bonding conductors shall run parallel and as close as possible to the DC cabling. It is also recommended to branch the bonding conductor to run parallel with all the DC cabling branches.

PV systems

The PV system installation information for TAYYEBAT is provided in Table 3 below.

Table 3: Facility PV installation information

Facility	PV installation	Orientation (°)	PV tilt angle (°)
PV-Section 1	27.36 with Elevated structure on the flat concrete roof	Refer to the attached conceptual detail in Annex I - (Tayyebat-PV Layout)	10°towards south
PV-Section 2	246.24 kWp on Corrugated Sheet Roof using **Clamps**	Refer to the attached conceptual detail in Annex I - (Tayyebat-	Following the direction and inclination of the roof

		PV Layout)	(towards West)
PV-Section 3	129.96 kWp on Corrugated Sheet Roof using **Clamps**	Refer to the attached conceptual detail in Annex I - (Tayyebat-PV Layout)	Following the direction and inclination of the roof (towards East)

The complete components summary is provided in Tables 4 hereafter.

Table 4: General Specifications for 'Hybrid'' system

General Specification table		
Photovoltaic Generator	Capacity	≥ 403 kWp Elevated structure and in Corrugated Sheet Roof **Installation by drilling into the Corrugated Sheet Roof is prohibited. Bidder should use clamps to install the PV panels** (Refer to the attached conceptual detail in Annex I - (Tayyebat-PV Layout)) Refer to Table 1 for detailed requirements
	Inclination / tilt angle	Refer to Table 1 and 3 for detailed requirements and Annex I - (Tayyebat-PV Layout)
	Type of module	Crystalline silicon, Min. 144 cells
	Orientation	Refer to Table 1 and 3 for detailed requirements and Annex I - (Tayyebat-PV Layout)
	Standards	IEC 61215 edition 2, IEC 61730-1 and -2, IEC 62716, IEC 61701, IEC 62804
	performance	More than 80% of initial nominal power rating after 20 years
	Module Efficiency STC	≥20%
	Warranty	≥10 years
Grid-Tied Inverter	Location	Outdoor with cover
	Type	Three phases transformerless
	Rated power	*Total inverter capacity:* ≥ 400KW *Individual* inverter capacity: ≥ 50KW **The Maximum acceptable DC/AC ratio is 1.1.** **The rated capacities are in KW and the minimum total capacities shall be selected by the bidders to match the specified capacities in KW and not in KVA.**
	Number of MPP tracker	≥ 3
	Protection Class	≥ IP65
	Minimum DC input voltage range	200 V - 1000 V or greater
	Maximum DC voltage	1000 V or greater
	Output AC voltage	3 / N / PE 230, 400 V (adjustable)
	Output AC frequency	50 Hz (adjustable)

	Power factor	0-1 (inductive and capacitive)
	THD	≤ 3%
	Consumption at night	≤ 16 W
	Maximum efficiency	≥ 98%
	Euro efficiency	≥ 97 %
	Cooling	Active the temperature de-rating curves are to be submitted, and inverter should ensure continuous output power at a temperature of 25 degrees
	Standards	Harmonic Current (IEC 61000-3-2 and / or IEC61000-3-4), IEC 62109-1/2
	Anti-islanding protection	Yes/ VDE 0126-1-1 or similar
	Communication	RS485, ethernet, RS232
	Additional requirements	Dynamic compensation of reactive power, inverter automatic reconnection conditions, linear output power control from a third device (read and write capabilities) and utility-interactive photovoltaic inverter system, reverse polarity protection, AC (AC surge protection could be inside the inverter, or installed outside the inverter) and DC surge voltage protection, AC operating under and over-voltage protection, frequency range protection.
	Permissible grid characteristics (inverter not to be disconnected or damaged)	Vp-n = 230 V ±20%; Vp-p=400 V ± 20%; Freq = 50 ± 5 Hz
	Warranty	≥5 years
Monitoring system	Type	Data logging (on local memory and online), local and remote monitoring at least and not limited to: input and output DC and AC voltages and currents, frequency, active and reactive power, active and reactive energy, power factor, alarms, faults, warnings for all available sources, weather data (irradiance, ambient temperature, cell temperature) derating of the on-grid system (optional)
	Communication	RS485, Ethernet and/or RS232 (compatible with Grid connected inverter, battery inverters/charges, sensors and electrical meters)
	Inputs	Meters, sensors, inverters, controllers, Grid (consumption), weather sensors
	Local monitoring	Monitored parameters should be available to be viewed locally on the independent screen installed on site and downloaded locally to a laptop in case there is no internet or remote monitoring is not functioning
	Outputs	Inverters, Grid (back-feeding)
	Logging online portal	Free of charge

	Data logger	Remote logging, 2 years data logging capacity, monthly evaluation report, calculation of indicators
Mounting system	Material	Anodized Aluminum/Hot dip galvanized
	Wind speed	140 km/h Gust speed 120 km/h continuous speed
	Installation	**Refer to tables 1 and 3 for details and tilt angle and Annex I - (Tayyebat-PV Layout)**
	Fixation	Elevated structure with Concrete ballasts cast on/off site with sample test or written confirmation on the quality of concrete matching standards Corrugated Sheet Roof with clamps for fixation (without drilling into the roof)
	Verification	Wind load calculations shall be submitted
	Warranty	- Mounting structures and accessories: Roof-mounted structures 10 years' product warranty from manufacturer. - Elevated structure: 2 years
PV plant controller unit	Type	Fuel save controller
	Communication	RS485, Ethernet and/or RS232 (compatible with Grid connected inverter, existing Genset Control Unit, environmental sensor and electrical meters)
	Inputs	Meters, sensors, inverters, Gensets Control Units, Grid (consumption)
	Outputs	Inverters, Grid (back-feeding)
	Data logger	Remote logging, 2 years data logging capacity, monthly evaluation report, calculation of indicators
	Functions	Maintain minimum load on diesel generator; Operation with at least 4 generators; Control active and reactive power from inverters; Prevent back-feeding into the generator; Zero-feed into the grid when not required; Export extra energy produced into the grid when net meter is installed; Gradual ramp up and ramp down of PV power; Emergency shutdown for the PV system; Ability to monitor which source is on load; Voltage and current measurements; Trip the PV system at anytime there is loss or interrupt of communication with the inverter;
	warranty	≥2 years

4- Components

Data Sheets

The supplied units shall consist of a variety of components, which are selected based on function, component compatibility, environmental conditions, required performance and site characteristics. Offerors are requested to provide details and data sheets that clearly show (highlight) the capacities, sizes and specifications, of the

components to be supplied. Failure to provide the requested data will disqualify the Offeror(s) from technical evaluation of their technical and commercial offers.

PV generator

Orientation for optimum yield

To optimize the PV generator's production concerning the estimated load, it is necessary to fulfil the following requirements:

The tilt angle and azimuth of the modules has been established to optimize the production with the needs. The building orientation is well specified in the drawings provided in Annex I - (Tayyebat-PV Layout). Distances on the buildings can be measured on the drawings in Annex I - (Tayyebat-PV Layout) and during required site visit. The bidder is to account for reservations in cabling. Cable routing on site should be the least disruptive for end users in the facility.

Shadowing of the PV modules from row to row, trees, buildings or any other obstacles should be minimized over the whole day and there shall be no shadows in a period of ± 5h w.r.t. solar noon. A shadow partially blanking off a photovoltaic cell may cause hot spots and loss of almost the whole production of this module, significantly reducing the performance of a complete string. It is the responsibility of the contractor to avoid mismatches in the system by connecting only modules with same capacity, voltage, orientation, and tilt angle to the same MPPT of the grid-tied inverter.

The surface for fitting photovoltaic modules to structures shall be perfectly flat in order not to induce mechanical stresses on securing the modules. Moreover, there shall be accessibility to perform for periodical cleaning and inspection.

The PV generator will be mounted in multiple rows where no shadow should be generated from one row to another during peak sun hours or a maximum shadow of 2% annually.

PV Modules

PV modules must be crystalline silicon PV modules that comply with the norm IEC 61215 edition 2 and shall be qualified to and be classified as Class A or B according to IEC 61730. PV modules shall also comply with the requirements of IEC 61701 (Salt Mist Corrosion test) and IEC 62716 (Ammonia Corrosion test).

The modules shall also be tested through at least one of the following quality and durability programs:

- Fraunhofer's PV Durability Initiative (PVDI) testing
- Atlas 25+ PV durability testing program
- PVEL's vendor qualification test program
- NREL's Qualification Plus for PV module reliability
- VDE Durability Testing Program
- TUV Sud Thresher or equivalent

Proof shall be submitted. Additionally, with clear certificates and highlighting the matching standards in each certificate, I-V curve must be supplied.

The modules shall be crystalline silicon made of a series-connection of 144 cells or more. Amorphous silicon and other thin film type cells are not acceptable under this tender.

The outside junction boxes with the positive and negative terminals shall incorporate bypass diodes that have the function of preventing any possibility of the electrical circuit inside the module being broken due to the partial shading of a cell.

The PV system design is based on a minimum module capacity at STC of 570 Wp. The bidders can propose other module with **greater** capacities (modules of lower capacities will not be accepted) for approval as long as the total PV generator capacities in the general specifications are met, fit in the available space, and each string has not more than the modules in series so that the Voc of the generator is within the specifications and fit with the selected grid-tied inverter.

PV Generator Junction Box

PV generator junction and fuse boxes are exposed to the environment, shall be readily available, shall be at least IP 65 and shall be UV resistant. The terminals must be clearly marked with + and – for the corresponding connections. Connections shall be of a screw type with a capacity of at least two 4 mm2 wires. Fuses must be of type gPV and installed for both positive and negative poles. If the location of the junction/fuse box is at a distance more than 10m from the panels, or the solar charge controller, it is required to install type II SPD for photovoltaic applications.

Switching Devices

All switching devices, shall comply with the following requirements:

- Have a voltage rating equal to or greater than 1,2xVOC
- Not to have exposed live metal parts in connected or disconnected state
- Switching devices installed at the DC part should be dedicated for DC applications
- AC circuit breakers should have a curve C or better
- Interrupt all poles

Cables

Cables (copper/aluminum) layout and installation shall be according to IEC 60364 standard. All cables length shall be accounted for by the Contractor. The distances per facility shall be accounted for by the contractor in line with the provided drawings in Annex I - (Tayyebat-SLD). Contractor shall check the cable lengths and cable routing during site visits. The contractor is required procure and install DC cables meeting or exceeding the required capacity, installation conditions, and specifications in the design. Cables' routing from solar panels to solar inverters should be in covered cable tray or in metallic conduits (EMT) depending on the cable routing and the location of the technical room (kindly refer to Annex I - (Tayyebat-Electrical Layout) for more information).

An existing underground trench for AC and communication Cabling between the PV totalizing Panel and the main panel board in the facility is shown in the attached Annex I - (Tayyebat-Electrical Layout).

DC cables must be UV and flame resistant with proper voltage(≥1500VDC) insulation where cables connecting PV strings to solar charge controllers, junction boxes or even joining panels together must be double insulated, fire resistant, temperature resistant (90°C), and specified for PV installations. Labelling of each cable or string is necessary using proper cable labelling device where labels must match the as-built drawings. Home runs from solar panels to DC combiners, inverters must be free from any cable junctions between source and destination. MC4 or DC cables' connectors at both ends of the cable must be installed by professionals to avoid any loose connections which may cause fire with time. MC4 connectors which will be interconnected together must be compatible to avoid any connection risks according to IEC 62852. Cable glands must be used for cables entry or exit to and from distribution boards, combiners boxer, and cable trays. UV resistance cable ties must be used in outdoor installations to resist sunlight and high temperatures in summer.

The cable cross section from the PV generator to the DC protection box, cable cross section from the DC protection box to the PV inverter, and the cable from the AC combiner box to the MDB shall be determined about both the minimum current capacity and the maximum voltage drop requirements (indicated in the technical drawings: SLD and Facility General Plan). The larger cable size obtained from these two criteria shall be applied. Voltage drop calculation notes to be submitted in the first submittal with the drawings.

The maximum acceptable voltage drop for DC is 2% and 5% for AC cables.

PV cables shall have a voltage rating of at least 1,2 VOC for the "hybrid system", which will have long PV strings connected to the PV inverter.; have a temperature rating higher than 40 °C above ambient temperature; be UV-resistant, or the cables be installed in UV-resistant conduit; water resistant and it is recommended that they be flexible (multithreaded). Voltage drop requirements are listed on the drawings.

Main AC cable from the AC combiner box for 'Hybrid systems' can be aluminum or copper suitable for underground trench installation. Each cable used must match its installation requirements and specifications.

Data and communication cables to be twisted double shielded and matching international standards especially on the separation distance from power cables.

DC Protection Boxes

Protection and disconnecting means shall be provided according to the drawings to isolate the PV generator from the solar inverter and to allow maintenance and inspection tasks to be carried out safely.

Support Structure

Mounting/support structures shall be solar mounting structures from a manufacturer specialized in solar mounting structures. The fixations of solar panels shall be from a manufacturer specialized in solar mounting structures.

Drilling holes in corrugated sheet roof for the installation of the structure is prohibited. The bidder shall submit the adequate clamp for support structure installation. Refer to Annex I - (Tayyebat-PV Layout) for roof design details.

The elevated structures should meet the ITB requirements listed herein in terms of material and installation details. The submitted (and hence implemented) elevated design shall meet the design requested as per the attached drawings.

For the elevated structure, the contractor is required to cast concrete bases or get ready concrete blocks as counterweights. **The counterweights or concrete design should be verified by wind load calculations specific to the proposed design and layout.**

All the mounting structures' material (mounting and elevated structures) shall be corrosion-resistant, lightweight aluminum or galvanized steel. The zinc coating should match a specification of 275g/m^2 with supplier proof or certification. All accessories shall be corrosion resistant. The same applies to all bolts, nuts, guy wires and fasteners. PV clamps are to be used in between modules shall be aluminum.

The contractor is responsible for casting concrete ballast to support the PV mounting structure. The casted concrete should have a smooth (use plywood) and sharp edge finishing and they all need to be of same size and dimensions. Bases must be aligned on both x and y directions.

All support structures shall be supplied and installed by the Contractor as per the requirements of the specific sites (mentioned in section IV Other Requirements sub-section Technical Specification), with great attention to the water proofing / thermal insulation and the corrosive environment. When sizing the support structure, the maximum load able to be carried by the selected installation area should be considered. The support frame shall be easy to install and maintain.

The contractor should submit detailed structural drawing with wind load calculation notes for all the structure (elevated and on corrugated sheet roof) as a proof to the compatibility of the proposed structure to the required wind load for UNDP approval before starting the implementation.

If any support structure was damaged or cut during installation or transportation, it must be treated by the contractor with same quality of coating as the original and matching environmental factors to avoid any corrosion in future.

Concrete type

The Concrete must be reinforced and of M30 or C30 grade (with provision of cylindrical test as per relevant EN206- 1 code). The cylinders are standard 150mm diameter by 300mm Length.

The C30 grade concrete should be able to withstand the compressive strength of 30MPa per square millimeter on the 28th day after casting. The contractor shall submit the concrete design before pouring any concrete.

Calculation of Compressive Strength

A minimum of three specimens should be tested for all ages, i.e. 7 and 28 days. The strength of the specimens should not vary by more than 15% of the average strength. The crushing strength is always the result of an average of three specimens. The measurements and reading required for the calculation of the strength test of concrete before and after the compressive strength test are:

- Size of specimens
- Area of specimens
- Characteristic compressive strength at 7th day
- characteristic compressive strength at 28th day
- Compressive strength is equal to the load / Area in N/mm^2

Test reports

A test should include an identification mark of the specimen, the date of the test, the age of the specimen, curing conditions, and the manufacturing date of the specimen. It can also include the appearance of a fallen specimen or any unusual characteristics, shown during the test.

Earthing System

The contractor shall test the resistance of the existing system; If it is less than 5 ohms, the photovoltaic system can be connected to it, and if not, the contractor must provide a new earthing system with a resistance value not exceeding 5 ohms. The Contractor shall verify that the earth connection to which all relevant components of the new installation are bonded, which will also protect the new distribution installation with differential switches.

The location of the earthing rods to be coordinated with UNDP and the beneficiary.

The Contractor shall connect the metallic chassis of all electronic equipment and PV structure with minimum 16 mm2 ground wire. The SPD (Surge Protection Device) shall also be grounded.

Grid-tied Inverter

The contractor should procure and install solar inverters meeting or exceeding the required capacity and specifications in the design. Solar Inverters must be installed according to the manufacturer's recommendations following the recommended installation and ventilation requirements. Inverters should be easily disconnected and removed for maintenance reasons. Necessary protection devices are required for the best safe operation of the system.

The grid-tied inverters are multi-string inverters. Bidders can select the capacity per inverter as long as the total capacity meets or exceeds the total capacity requested in the system specifications taking into consideration the minimum capacity per inverter mentioned in table 1 (in section IV Other Requirements sub-section PV system, and the technical drawings provided in Annex I - (Tayyebat-SLD). The selected capacity and the configuration shall be submitted by the bidders at the bidding stage. The inverters control the current into the grid to meet the requirements for interaction functionality. These standards include a voltage and frequency range and requirement for "anti-islanding" to ensure that the inverter disconnects from the utility

grid if not within the specified conditions. The grid-tied inverter should accept control signals from the fuel save controller for power curtailment, active and reactive power control.

It is preferable that quoted inverters be of the same manufacturer; if quoted inverters are from different manufacturers, a letter certifying the proper communication and operation of the system as a whole should be submitted. It is recommended that each PV generator with similar physical and radiation characteristics (tilt, temperature, radiation, orientation, etc.) are connected to one single MPPT.

Moreover, the inverters shall be constantly monitored and controlled by the fuel save controller to ensure the proper operation of the overall plant.

The grid-tied inverters may be located in outdoor environments; therefore, the enclosure shall be IP 65 or better. **Additionally, a shading structure to protect the inverters from direct sunlight and high temperatures shall be supplied and installed by the Contractor**, unless there's a shaded side of the roof where the inverters can be installed. Inverters are to be installed according to their environmental protection rating and ambient temperature range.

Protection against AC surge voltages is required and the DC surge voltage protection is required when distances exceed 10m between PV panels and inverters.

The Grid-tied inverter (for 'hybrid' systems) requirements shall also include the following:

- Dynamic compensation of Reactive Power
- Inverter automatic reconnection conditions
- Linear output power control via fuel save controller
- Utility-Interactive Photovoltaic inverter system

Fuel Save Controller

The PV plant controller unit shall be a fuel-reduction device, tested with successful experience of at least 4 years in operation in similar conditions and shall be able to communicate with the inverters to guarantee the proper operation of the existing gensets (genset efficiency, minimum part load, spinning reserve, reverse current protection, etc.).

Contractor shall supply and install power meters, dry contacts, current transformers or necessary measurement accessories on the genset and grid power lines to read the genset's and grid's operational parameters. The fuel save controller also must detect which source other than the PV is supplying the load to adjust its internal mode of operation.

Fuel save controller shall always be maintained online even during power transfers between the different power sources and for this reason a small **UPS** should be supplied with the fuel save controller.

The PV plant controller unit should integrate communication protocols compatible with:

- Reading capabilities: current and voltage sensors
- Writing capabilities: Inverters' active and reactive power

The Fuel save controller is recommended to maintain a minimum of 20-25% of the total generator's capacity (minimum diesel generator load) as a remaining load on the diesel generator after PV penetration. Any PV production beyond this value should be curtailed by the fuel save controller for the safe operation of the diesel generator.

Monitoring System and Datalogger

The contractor should procure and install a monitoring system which enables the beneficiary (TAYYEBAT) to monitor energy production, energy storage, and energy consumptions as well as system alarms, voltage, current, instantaneous power. The system should store the data where this data can be viewed daily, weekly,

monthly and annually. The monitored data should have the option of being viewed and logged online and locally on an **independent screen**.

The Monitoring sub-system unit should implement the communication with the following equipment:

- DC Current and Voltage Transducers:

Internal or external DC current transducers to measure: Electrical energy from PV generator, electrical energy to PV inverter and battery inverter/charger.

- AC Meters:

Digital single/three-phase phase meters with output pulse signal (open collector 1,000 p/kWh); class II; 230V-50Hz or 400V-50Hz; input: current (depending on rated power), Dimension 1-DIN module, compatible with monitor system.

- Communication and Signal Interface:

Device for real time visualization and download of stored data

Integrate communication protocols compatible with external sensors (weather and other), meters, battery inverters/chargers, solar chargers.

The data logger shall have data logging capacity that computes averages or integrates at least the following hourly values: Month, day, hour, Irradiation on the plane of the PV array, PV energy generation, PV inverter output power, maximum daily PV power, generator and EDL load, average voltage.

Additionally, the logger shall allow remote and local monitoring and shall have at least the capacity to store two years of data.

- Energy Display Unit:

Energy management computing with display at least of: Power values of PV generator, power in/out from the PV inverter and battery inverter (W), irradiance (W/m^2); ambient temperature (ºC), installation reference number; solar charge controller settings.

- Evaluation software

Software PC compatible to perform monthly evaluation reports with at least the following indicators: year, month, energy values (kWh, avg. daily PV generator normalized yield (KW), avg. daily final normalized yield (KW), performance ratio (%), solar fraction (%), AC energy consumed from the grid, AC energy delivered to the grid.

The software shall enable alarm configuration. Contractor will have to supply and mount the monitoring sub-system in the technical room and wire it. The final arrangement of components inside the technical room shall be approved by the projects' supervisor.

Electrical Enclosure

Excluding the PV generators and grid-tied inverters, all the components - i.e. main board, switches and protective devices as well as connection of the different components shall be installed and labelled in an enclosure–supplied and installed by the Contractor.

A drawing or sign on the technical room shall provide warning about safety hazards, e.g. smoking, water contact, etc. as well as emergency shutdown procedures.

A panel in the technical room and near the PV inverters shall provide basic operation instructions in Arabic as well as in English.

The contractor shall install a general project information banner and another one with up keeping and operating instructions for the beneficiary (TAYYEBAT) attached to the technical room. These banners shall be supplied by the employer.

The AC combiner box for the On-grid PV system should have the necessary protection for each grid-tied inverter as per the SLD where all breakers will be combined in one cable to go to PCC.

Interconnection to the Grid

Point of Coupling

For the 'hybrid' system, the point of common coupling will be inside the main distribution board existing in the electrical room.

Voltage surge protection

To protect against surge overvoltage from the utility side it is required to install type 2 SPDs (Surge Protective Device) as near as possible to the grid-tied inverter's output.

Additional type 2 SPDs, specific for PV application, for the DC strings are required if the distance between the inverters/solar charge controllers and the PV panels is greater than 10 meters. These SPDs shall be installed at a distance less than 10 meters from the PV panels.

This equipment will leak the energy of the overvoltage to the ground. For this reason, earth terminals must be of a good quality and it is required that all the earth terminals be properly connected to assure equipotentiality.

The required SPD should be able to discharge high currents caused by an induced overvoltage, therefore, it needs to be a type 2 according with IEC 61643 standard. To ensure the good performance of the equipment, it needs to be at least 5kA as maximum current (Imax). Because the grid-tied inverter is very sensitive equipment, the SPDs need to have been tested, in addition, as a type 2. The type 2 SPDs are specially designed to protect the most sensitive equipment. In addition to these technical features, the SPD must incorporate an EMI filter in order to protect the SPD itself and the equipment from the electromagnetic noise of the electrical grid.

Electrical Installations

The electrical installation shall be designed according to the national standards. All cables and wires shall have an adequate cross section that takes into account the maximum current, the installation method, total distance and voltage drop from source to MDB less than 5% as a cumulative drop from the PV modules to the PCC. Current carrying cables as well as sensor wiring shall be protected from physical damage and the solar radiation by UV resistant conduit or equivalent. PV modules' cables should be connected in a professional and well-organized way taking into consideration the bending radius of the cables especially at the junction box of the panel. Untight and loose cables laying in air under the panels are not accepted. Voltage drop calculation notes shall be submitted in the first submittal with the drawings.

All cables must be installed according to norms and standards especially at the level of safety, bending radius, and UV and fire exposure.

All cables must be labelled at the source connection, on the way, and at the end of connection to ease future maintenance or dis-assembly. Cables exposed to mechanical stress, hard surfaces, or loss of insulation while installation are not accepted and should be replaced by the contractor before handover.

Cables which are installed on cable trays that are running on the floors and there is no means to mount the cable tray safely to the floor, contractor must supply counterweights and tighten the cable trays to counterweights. Cable trays must be rigid enough to withstand any possible steps on the cable tray without any shape deformations.

The contractor is required to submit the following documentation:

- Detailed engineering report, to be approved by UNDP before start of works. Including civil construction drawings, physical layout drawings, functional drawings, SLDs, structural calculation notes, shading loss calculation, cable and protection sizing calculations, all technical datasheets and other manufacturer's technical documentation.
- BOQ per system and total BOQ
- Factory acceptance test reports
- Operation & Maintenance manual

The Contractor shall provide as-built drawings and technical documentation in English.

The Contractor shall provide operation and maintenance manuals for the beneficiary's user and maintenance staff in English and Arabic.

The contractor is to provide:

1 day training on design, sizing operation and maintenance to industrialists and TAYYEBAT technical staff

½ day training on operation and maintenance to TAYYEBAT technical staff

5- Installation Requirements

General

Installation works shall follow best international practices, ensuring proper system operation and safe installation methods. Proper connections and reliable integration with network are the responsibility of the contractor.

PV Generator Mounting Structure

Site constrains shall be taken into account and pre-installation site visits are required to collate space available, distances between sub-systems, shading, special loads, etc.

For PV, tilt and orientation have been optimized for yearly best performance operation. Cleaning of panels and maintenance should be taken into consideration when designing the mounting structure where cleaning and maintenance persons should have a safe access to the PV panels. Installation of the mounting structure must be checked and confirmed to be strong, rigid, and long lasting as required in this ITB specs. Installation of the structure which may cause any harm or effect on other roof systems (pipes, water tanks, solar water heaters, etc..) which is the contractor's responsibility prevent any damages caused to other systems or roof elements during installation.

Placing the Inverters

The grid-tied inverters shall be installed outdoor/indoor (refer to Table 4) as indicated in the technical drawings depending on the site specifications and the signal wiring requirement (point to point interconnection max length) and the cable cross section requirement. The exact location must be agreed by UNDP and the beneficiary (TAYYEBAT). The grid-tied inverters' enclosure shall be IP 65 or greater.

To be noted that the grid-tied inverters are located outdoors in a dusty environment, therefore, the inverter's manufacturer shall grant the proper operation of the inverters with the conditions on site, and if necessary, a forced ventilation shall be added by the Contractor.

Additionally, a shading structure to protect the outdoor inverters from the heat, direct sunlight, rain, and high temperature shall be supplied and installed by the Contractor, unless there is an unshaded area on the roof where the inverters can be located. If necessary, forced ventilation shall be accounted for by the Contractor.

Cables

Cables joining PV panels must be installed in a professional way using metallic clips or UV cable ties tied to the structure or the PV panels where no loose cables are allowed to be dangling under the panels or subject to vibrations from wind. PV cables are advised to run in parallel with earth cable to decrease the electromagnetic loop area as much as possible between the live conductors and earth. For cables joining panels together, the maximum bending radius must be respected especially at the output of the junction box where at least 10cm arc should be left to prevent any stress on the PV panel's junctions box.

Cables should be terminated using the necessary cable lugs according to the best practice. All incoming and outgoing cables must be labelled. Labelling of cables is recommended for every 5 meters specially DC side. Careful care must be taken into consideration when pulling cables to avoid any damage to the insulation of cables.

Cables entering the building should be inside covered cables trays or rigid conduits where a separation distance should be respected between power and data cables depending on the type of cables used.

For underground cables, the submitted cables should be approved for this type of installation.

Interconnection to the facility grid

The interconnection to the grid is done in the existing main panel at the facility if it can be adapted to house more devices or in a new additional panel installed beside the existing one. Contractor must install a separate totalizing panel with protection device near the PCC and then connect to the main busbar of the facility or to an existing not used circuit breaker (as mentioned in the attached Annex I - (Tayyebat-SLD). The main interconnection to the facility grid should be highly coordinated with the UNDP and the facility especially that this is very critical when supplying power to the facility.

Plant Maintenance and Operation

Contractors shall conduct onsite training of UNDP's and TAYYEBAT's staff and technicians on all related operation and maintenance issues of the PV Systems. Also, the contractor is required to provide the O&M services as listed under section IV Other Requirement part 7 Operations and Maintenance.

6- Validation Test Checklist

The contractor shall provide the validation test and acceptance test procedure for approval. The reference checklist provided shall be taken into consideration only as guidance and shall not relieve the Contractor from his direct responsibilities and shall be reliable and responsible for the design and installation of the PV systems.

A sample checklist is provided in the following sheets:

Sheet 1: Acceptance of photovoltaic generator

Sheet 2: Acceptance of measuring and control instruments

Sheet 3: Acceptance of inverters

Sheet 4: Acceptance of LV distribution board

The main aspects to be tested are: Generator subsystem – testing of performance and compliance with standards; inverter subsystem – testing of all functionalities in all modes and power configuration setting. All tests shall be carried in presence of Employer's representatives based on approved testing procedures. All test procedures shall be in accordance with the requirements of IEC 62446-1 (or equivalent) where applicable.

The Contractor shall instantly fix any malfunction resulting from the test and repeat the test

Sheet 1: sample Acceptance of photovoltaic generator

PV generator		Reference	Remarks		Comments
		Value	conform	non conform	
Modules	Unit STC capacity				
	Technology				
	Quantity				
	Manufacturer				
	Reference				
	Serial numbers and flash report				
	Existence by-pass diodes				
	Aspect				
	Sealing efficiency of junction boxes				
	Orientation				
	Tilt				
Assembly	Shades (if any)				Record if necessary
	Distance to storage cabinet				
	Type of structure				
	Structure material				
	Mechanical strength				
	Bolts and nuts material				
Structures	Resistance to corrosion				
	Effect on building's tightness				
	Quality of attachment fittings				
	Quality of anchors and concrete				
	Earthing				

Cabling		Reference	Remarks		Comments
		Value	conform	non conform	
Interconnections of modules	Cable type				
	Cross section				
	Length				
	Protection of junction				
	Junction attachment				
Modules-to-junction box	Cable type				
	Cross section				
	Length				
	Quantity				
	Protection of junctions				
	Attachment of junctions				
Junction box	Quantity of boxes				
	Number of strings per box				

	String fuses specifications					
	Sealing efficiency					
	Box attachment quality					
Cabling Control through disconnected string	V_{OC} and I_{SC} per string	V_{OC}	I_{SC}	R_{ISO}		Reference sunshine in (W/m^2)
	string 1					
	string 2					
	string 3					
	string 4					
	string 5					
	string 6					
	string 7					
	string 8					
	string 9					
	Total generator current					
PV generator / Technical room (Grid-dependent inverter)	Cable type					
	Cross section					
	Length					
	Number of junctions					
	Attachment of junctions					
	Existing lighting arrestors					
	Voltage drop at I max					
Cabling control by input controller on load	V and I via control input	V	I			Reference sunshine in (W/m^2)
	input 1					
	input 2					
	input 3					
	input 4					
	input 5					
	input 6					
	Total generator					

Sheet 2: sample Acceptance of measuring and control instruments

Measuring and control instruments		Reference	Remarks		Comments
		Value	conform	non conform	
Location of installation	Location and access				
	Visibility and legibility				
	Cubicle ventilation				
	Technical room lighting				
Type	Manufacturer				
	Reference				
	Rated voltage				
	Serial number				
	General schematics present				
	Terminal strip marking				

Displays	Solar field current measurement				
	Utilization current measurement				
	Ah/Wh production measurement				
	Ah/Wh consumption measurement				
Data acquisition	Manufacturer				
	Reference				
	Rated voltage				
	Serial number				

Sheet 3: sample Acceptance of inverters

Converters		Reference	Remarks		Comments
		Value	conform	non conform	
Commissioning date:					
d.c./a.c. inverter	Inverter				
	Manufacturer				
	Reference				
	Serial number				
	Rated a.c. power or current				
	Peak a.c. power or current				
	Rated voltage input				
	Input voltage range				
	Rated output voltage				
	Output voltage range				
	Rated output frequency				
	Output frequency range				
	Output signal type (wave)				
	Consumption at zero load				
	Specific over current protection present				
	Adjustable «standby» mode				
	Spare parts present				
	Technical documentation (yes/no)				

Sheet 4: sample Acceptance of LV distribution board

Distribution boards		Reference	Remarks		Comments
		Value	conform	non conform	
General LV Board	Location and access				
	Visibility				
	Maximum current				
	Earthed polarity				
	Earthed neutral				
	Control power supply outage				
	Supply general circuit breaker				
	Overload protection				
	Protection against direct contact				
	Protection against indirect contacts				

	Plant schematics present				
	Cross section cabling				
	Inside cabling marking				
	Terminal strip marking				
	LV cabinet IP protection				
	Board earthing				

7- Operation and Maintenance

The contractor is responsible for a 2-year Operation and Maintenance of the system – an indicative template is provided in Table 5.

Scope of O&M Services

Operation & Maintenance (O&M) is a critical service provided in any solar PV project. The O&M obligations during the performance guarantee period should cover the various types of maintenance strategies for a PV plant including yet not limited to the following:

- **Preventive Maintenance activities** are the core element of the maintenance services to a PV plant. It comprises regular visual and physical inspections, as well as verification activities conducted with specific frequencies. It is under the responsibility of the contractor to prepare the task plan until the end of the contract.

- **Corrective Maintenance** covers the activities performed by the Maintenance team in order to restore a PV plant system, equipment or component to a status where it can perform the required function. Corrective Maintenance include:
  - Fault Diagnosis: also called troubleshooting to identify fault cause and localization
  - Temporary Repair: to restore the required function of a faulty item for a limited time, until a Repair is carried out
  - Repair: to restore the required function permanently

- **Predictive maintenance** is a Condition-based maintenance carried out by evaluating typical patterns of significant parameters of plant components degradation. Predictive techniques help to determine the condition of in-service equipment to predict when and whether maintenance should be performed.

The intervention of the contractor should be within two weeks of the due date for preventive maintenance and a report with tasks' checklist should be sent to the beneficiary "TAYYEBAT" within three weeks of the due date. The intervention of the O&M contractor for corrective maintenance should be as follows:

Fault	Response Times
The entire Facility is not generating Energy (i.e. one hundred percent (100%) generation loss)	Twenty-four [(24)] hours
Thirty percent (30%) or more Energy generation loss	Twenty-four [(24)] hours
Less than thirty percent (30%) Energy generation loss	Thirty-six [(36)] hours

Preventive Maintenance

The scheduled maintenance should be carried out at intervals planned in accordance with the manufacturers' recommendations and as required by the equipment warranties.

Table 5 below includes the frequency of the preventive maintenance activities that must be carried out in accordance with the manufacturers' recommendations.

Table 3: Frequency of the preventive maintenance activities

Item	Preventive Maintenance Service Description	Frequency
PV Arrays		
1	Visual inspection and cleaning recommendation to the beneficiary) of PV system's general site conditions and the PV system, PV strings, electrical equipment, mounting structure, shading, vegetation, damage, erosion, corrosion, and discoloured panels and cleaning / recommendations to the beneficiary	Every 6 months
2	Visual inspection and correction of PV system for loose electrical connections and ground connections	Every 6 months
3	Clean PV modules with plain de-mineralized water with mild detergent recommended by the manufacturer to remove any dirt or stains from the PV module then dry it with a dry cloth. DO NOT use high-pressure water, chemicals, corrosive solvents, brushes, or hard objects for cleaning	Annual or when required (twice in dry seasons)
4	Measure open-circuit voltage (Voc), Short Circuit Current (Isc) of PV strings, Maximum Power Point (Vmp) and (Imp), and DC operating Power	Annual
5	Check the MC4 Connectors between modules and replace damaged ones	When required
6	Calibrate controllers and sensors	When required
Inverter		
1	Inspect inverter housing or shelter for physical damage maintenance if required	Annual
2	Clean inverter cabinet air vents	Annual
3	Clean and change inverter air filters, if present, per manufacturer's warranty Requirements	Annual or when required
4	Clean/remove dust from inverter heat sinks per manufacturer's warranty Requirements	Annual
5	Check inverter fan motor	Annually
6	Check inverter data acquisition card (in close coordination with the manufacturer)	Annually
7	Turn off and on logging and communications to ensure they are communicating and ensure battery backups are working	Annual
8	Check the AC cable for any loose connection at the output of the inverter and tighten again the connection	Annual
9	Check the DC SPD for burnt fuses inside or near the inverter	seasonal
10	Collect and inspect inverter logs (alarms and faults logs)	Monthly (remotely)
11	Check inverter's well behavior with safe fallback settings	Monthly (remotely)
12	Perform thermal imaging to test electrical connections for Inverters	Every 6 months
Mounting Structure		
1	Inspect mounting structure for abnormal movement and tighten as necessary using torque	Annual

	meter	
2	Inspect roof penetrations to ensure sealant is applied properly and not degrading	Annual
3	Check metallic structure for signs of corrosion, remove rust, and re-paint if necessary	Annual
DC and AC Wiring Systems		
1	Open each combiner box and check that no fuses have blown and that all electrical connections are tight. Check for corrosion or intrusion of water or insects. Seal boxes if required.	Annual
2	Inspect combiner boxes and tighten connections to manufacturer's torque specification. Report broken terminal blocks	Annual
3	Look for any signs of intrusion by pests such as insects and rodents. Remove any nests from electrical boxes (junction boxes, pull boxes, combiner boxes) or around the array.	Annual
4	Check proper position of DC disconnect switches and fuses and replace failed fuses.	Annual or when required
5	Check the AC disconnect box and the position of AC disconnect switches and breakers	Annual
6	Inspect cabling for signs of cracks, defects, pulling out of connections, overheating, short or open circuits, and ground faults	Annual
7	Test the disconnect switches to ensure they are not jammed	Annual
8	Test system grounding	Annual
9	Earth Continuity test to check if there is a good connection between the Earth pin on the plug and the case of the appliance	Annually
10	Insulation resistance Riso (resistance in ohms of wires, cables to guard against electric shocks and avoid equipment damage from accidental discharges)	Annually
11	Check the SPDs for any blown fuses	In every site inspection
12	Perform thermal imaging to test electrical connections for /String Box/AC combiners etc…	Every 6 months
Monitoring System, and data logging		
1	Testing of monitoring system communication	Annual or when required
2	Check internet connectivity and data upload on the web portal	Monthly, online monitoring
Fuel-save controller (for ON-Grid systems)		
1	Check the load reading at the Diesel generator and Mains at the fuel save controller software and compare with actual reading by clamp meter	annual
2	Check the digital input for proper status activation	annual
3	Check if the minimum Diesel Generator load is well maintained	annual
4	Check communication with the inverters	annual
PV System Documentation		
1	Document details of preventive maintenance work, such as condition observations, work performed, meter readings, and system testing results	As performed
2	Include non-conformance reports to identify potential short-term and long- term power production issues	Annual
3	Update as-built drawings if necessary	When required

Corrective Maintenance

Corrective maintenance is carried out in response to failures. As such, the key parameter when considering unscheduled maintenance is diagnosis, speed of response and repair time.

The common unscheduled maintenance requirements include but not limited to:

- Addressing inverters fails and faults
- Tightening cable connections that have loosened
- Replacing blown fuses
- Repairing lightning damage and surge arresters
- Repairing equipment damaged by intruders or during module cleaning
- Rectifying monitoring system faults
- Repairing mounting structure faults

Repairs may be delayed only if there is an opportunity to do the repair more efficiently in the near future and subject to the availability of spare parts.

Reporting for any intervention of the contractor must be done within **three days** of the date of the intervention.

A predictive maintenance may be done during a corrective maintenance if the next scheduled predictive maintenance is happening after or within a week from the predictive maintenance where the other scheduled predictive maintenance date stays unchanged.

Replacement (at the contractor's / supplier's expense) of system parts should be with items of same specs or by the approval of the beneficiary (TAYYEBAT). Replacements should be carried out in accordance to the manufacturer's guarantee/warranty – for the period covered by the warranty.

Spare Part Management: To facilitate a rapid response considering the current situation the contractor is requested to account for additional critical equipment to be stored at the facility, in the case of the present bid: 20 PV panels, 1 inverter of each size, 20 DC fuses, 5 complete SPD devices (for Each AC and DC). The contractor is to hand over the spare equipment to the facility at the handing over of the project.

Terms & Conditions

The contractor has to provide a detailed maintenance plan for the installed PV system for the overall period of O&M.

The minimum guaranteed availability of the system must be 98% over each operational year.

The Contractor is to provide the services in accordance with all laws, authorizations, good industry practice, planning consents, manufacturer's warranties and operating manuals and to the standard of a reasonable and prudent operator.

The preventive schedule of site visits shall be coordinated with the beneficiary (TAYYEBAT).

Sample Operation and Maintenance Site Inspection Report

Note: This is a sample report, the bidder is allowed to propose an alternative format and/or requirement. The adjustments need to be fully coordinated and agreed upon with UNDP project team.

Date of Site Visit:

Site Name:

Site Description:

System Size:

Inverter Details:

Table 4: Operation and Maintenance Report for PV string Test & PV DC Power Test

				PV String Test				
Operator Name							Site Name	
							Date	
Inv #	String #	Voc	Isc	IRR	Riso	Panel Temp.	Amb. Temp.	Time of Inspection

				PV DC Power Test				
Operator Name							Site Name	
							Date	
Inv #	String #	IRR	Vmp	Imp	DC Power	Panel Temp.	Amb. Temp.	Time of Inspection

VIII. Terms of Execution

Timeframe: The Start date of the contract is immediate. The overall term of execution of this contract is spread over **4 months**, effective from contract signature date. This includes the delivery of the equipment to the warehouse (in or near the indicated regions) accounted for by the Contractor, then to the site, the installation of the equipment, the testing of the system and the delivery of technical documentation, specifications and operation and maintenance manuals of the installed systems to the client/beneficiary. The awarded party must comply with the terms of reference of this invitation to bid, and to have all deliverables completed and approved before/by the last working day of the contract period. Extensions, if deemed necessary, can only be granted through mutual agreement between the parties.

Shipment and Storage: The awarded party is responsible for clearing delivered equipment from Beirut port. The awarded party is also responsible for ensuring an adequate interim storage space for all delivered equipment.

Branding Display: All labelling related to the equipment's brand name, model or other, must be highly discreet and unobtrusive, and readable only from very near distances of less than 1m.

Replacement and Spare Parts: All components that maybe replaced during the lifetime of the product need to have spare parts available with the Contractor. The spare parts need to be available for the equivalent lifetime of the fixtures after the date of installation. Equivalent parts replacing the installed item can be proposed for the customer's approval.

Guarantees:

The supplied installations shall be tested, commissioned, and handed over complete and in perfect operating condition and shall be covered under a defect's liability (parts and labour) for a minimum period of 24 months from the date of commissioning. This warranty covers all manufacturer / work-person-ship defects only.

Furthermore, all main components shall also have an individual warranty of defects in materials and workmanship and an operation and performance guarantee backed by the manufacturer for the periods specified in tables 4.

The Contractor must be available to answer any request that comes from the client. The reply delay of the Contractor should be within one week. The Contractor has a maximum of one month to replace any defective component.

It is understood that any alteration made to the product without the prior written approval of the Contractor will automatically cancel the remaining warranty period on the affected part.

The contractor shall conduct preventive, corrective and predictive maintenance for 2 years based on the contract signed with the beneficiaries and shall provide the details of the O&M plan prior to project handover.

General Conditions

- The Contractor shall state the manufacturers guarantee on the different components as well as local representation available for service and technical support.
- The Contractor shall secure a team of specialists, technicians and skilled workers qualified to carry out the requested tasks successfully. The number of teams shall be sufficient to carry out the required works within the specified time frame of the contract.
- UNDP has the right to decline the Contractor's team if it proved to be technically unqualified. The Contractor then should secure a replacement within 48 hours from notification and should remain bound to the schedule of delivery.
- The Contractor shall visit the selected sites assigned to inspect them prior to the installation and to prepare an installation plan to collate the amount of work to be done in each facility.
- As soon as the Contractor receives UNDP's instruction to initiate the work, the Contractor must secure a prior written and signed approval on all the procured materials that will be used during the installation and has to obtain prior approval of UNDP on the installation plan after coordination with the User/Beneficiary in order to facilitate the access of the Contractor's team.
- The systems and components delivered to the selected site shall be considered under the Contractor's responsibility until the final handover. It may be noted that the road conditions may be adverse, and the packing shall therefore protect the equipment thoroughly from moisture and vibrations.
- The Contractor should remove the waste of works including the trash and dirt and dispose of it according to environmental regulations when applicable. The site should be returned to initial state of cleanliness.

IX. ANNEXES

Annex I - Drawings

Annex II - BOQ and Inventory tables

C. Delivery and other Related Requirements

Delivery place / terms (INCOTERMS 2020)	DDP, Delivered Duty Paid: Delivery at Place and Customs Paid Exact Address of Delivery/Installation Location: TAYYEBAT Facility, Insariyeh, South Lebanon, Lebanon
Customs clearance (must be linked to INCOTERM)	Shall be done by: ☒Supplier/Bidder
Warranty Period	Under this contract, the contractor should provide the warranties mentioned in the specification for each item. Moreover, for each warranty, the contractor should provide a local representative office in the country and after sales service for equipment/parts.
Payment Terms *(max. advanced payment is 20% as per UNDP policy)payment*	The payment must be submitted as per the below milestones upon completion and engineer's acceptance of the works **(VAT payments shall be processed and paid by UNDP in Lebanese Pounds as per the government circular regarding the VAT):** • **First Payment: Twenty Percent (20%) (within 1 month after contract signature):** Upon submission of detailed Planned Schedule of works; insurances, All shop drawings showing single line diagram and schematics, including electrical, mechanical and civil works and calculations (wind load for structures, voltage drop calculations), simulations done (in PVSyst or similar) to calculate the energy output and energy losses due to any shading effect (obstacles, inter-row spacing, etc..); Submittals for all components to be installed including datasheets and required certificates; A letter certifying requirements on warranties, spare parts and standards after UNDP acceptance and upon completion of **20%** of works on site and after UNDP acceptance. • **Second Payment: Forty Percent (40%) (within 3 months from contract signature):** upon completion of **70%** of the works on site and after UNDP acceptance • **Third Payment: Forty Percent (40%) upon completion of Deliverable 3 (within 4 months from contract signature):** upon Complete Commissioning and full operation of the PV system as per requirements; ½ day training for engineer/technicians on the Operation and Maintenance of the PV system; Submission of O&M manual in English and Arabic, and as-built drawings – and after UNDP acceptance. - Note: For each of the payments, the contractor shall attach the following: - The mentioned documents in the section 5.A "Reporting", - any non-conformity submittal issued - BoQ showing the current executed percentage for each item, the previous percentage executed in last payment, the difference between current & last percentage of the executed works, the amount to be paid for each item - For the final payment, performance security equivalent to 10% of the final contract value and valid for a date up to a minimum of thirty days after

	issuance by the Engineer of the Certificate of Final Completion (if such value and/or date is/are different than those provisioned at contract signature) - The Contractor shall be paid based on the budget and BoQs presented.
Conditions for Release of Payment	☒ Successful Completion of Requested Works ☒ Testing ☒ UNDP Acceptance requirements
All documentations, including catalogues, instructions and operating manuals, shall be in this language	English

SECTION 6: CONDITIONS OF CONTRACT AND CONTRACT FORMS

6.1 General Conditions of Contract
In the event of a Contract, the following General Conditions of Contract (GCC) will apply: UNDP General Terms and Conditions for Works

The conditions are available at: http://www.undp.org/content/undp/en/home/procurement/business/how-we-buy.html

6.3 Contract Form
In the event of an award, the following sample Contract will be used: Contract for Civil Works

The contract is available at: http://www.undp.org/content/undp/en/home/procurement/business/how-we-buy.html

6.5 Performance Security

Performance Security must be issued using the official letterhead of the Issuing Bank.
Except for indicated fields, no changes may be made on this template.

Beneficiary: Insert contact information for procuring organisation as provided in Section 3: Data Sheet.
ITB Reference: Click or tap here to enter text.

PERFORMANCE SECURITY No.: Click or tap here to enter text.

We have been informed that insert complete name of Supplier (hereinafter called "the Supplier") has entered into Contract No. Click or tap here to enter text. dated Click or tap to enter a date. with you, for the supply of description of goods, works and/or services (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a Performance Guarantee is required.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum(s) not exceeding insert currency and amount in figures and words upon receipt by us of your first demand in writing declaring the Supplier to be in default under the Contract, without cavil or argument, or your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This Guarantee shall expire no later than Click or tap to enter a date. and any demand for payment under it must be received by us at this office on or before that date. We shall agree to a one-time extension of this guarantee for a period not to exceed Choose an item., in response to Click or tap here to enter text.'s written request for such extension, such request to be presented to us before the expiry of the guarantee.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

SIGNATURE OF AUTHORIZED REPRESENTATIVE OF THE SUPPLIER

Signature: _____

Name: _____

Title: _____

Date: _____

SIGNATURE AND SEAL OF THE GUARANTOR BANK

Signature: _____

Name: _____

Title: _____

Date: _____

Name of Bank _____

Address _____

[Stamp with official stamp of the Bank]

6.6 Form of Agreement with Financial Service Provider -Not Applicable

Date

N.N.
Managing Director
Name of the company
Address, Beirut, Lebanon

To whom it may concern,

The Company [financial service provider] is a money transfer company duly incorporated under the laws of the Lebanese Republic and registered with the …… Register of Commerce under number …… and licensed by the Central Bank of Lebanon (if relevant: and fully owned by …….).

The *[UNDP Contractor]* contracted *The Company* in … of this year for a …. month contract to complete the financial transfers necessary for the delivery of cash payments to beneficiaries as part of **…….** related to delivery of assistance to vulnerable persons in Lebanon.

Prior to every disbursement of funds to any person included on the list of beneficiaries, *The Company* processes the list of names centrally in their main office in ……, and verifies the submitted data according to the process outlined below:

1. *The Company* verifies that the submitted soft copies match the agreed upon templates
2. *The Company* inputs the names of the beneficiaries into its system
3. The system, per the Banque du Liban requirements, verifies the names of the beneficiaries against international sanctions lists
4. If the beneficiaries' names are cleared, *the Company's* system generates a list of reference numbers corresponding to the names of the beneficiaries and matching the beneficiaries' names as they are featured on their IDs
5. The reference numbers are transmitted via an automated SMS delivery mechanism to the beneficiaries' phone numbers
6. In parallel, *the Company's* system notifies its network of agencies across Lebanon of each dollar amount corresponding to a reference number and a matching ID name
7. In parallel, *the Company's* finance system generates a report for failed or succeeded transactions which is shared with UNDP once amounts are loaded

The Company requires a maximum of two working days to complete this process, and beneficiaries are then able to collect payments from any agency of *the Company*.

The consolidated amount of each service offered via *the Company* is channeled through the banking system and is purged by BdL clear at end of day. *The Company* confirms that all persons included on the lists shared by UNDP are checked by way of the process described above. Should any person be found to be on any watch list, the transfer will not go through and UNDP will be notified immediately. Names identified to be found on a watch list are referred to BdL's Special Investigative Commission (SIC) for further investigation by *the Company's* Compliance Officers.

Sincerely,

SECTION 7: BIDDING FORMS

Form A: Bid Confirmation

Form B: Checklist

Form C: Bid Submission

Form D: Bidder Information

Form E: Joint Venture / Consortium / Association Information

Form F: Eligibility and Qualification

Form G: Technical Bid

Form H: Price Schedule

FORM A: BID CONFIRMATION

Please acknowledge receipt of this ITB by completing this form and submit it through Quantum using the link specified, in the Letter of Invitation.

To: Insert name of contact person — Email: Insert contact person's email - do not enter secure bid email address

From: Insert name of bidder

Subject ITB reference LBN-CO-ITB-6-24

Check the appropriate box	Description
☐	**YES**, we intend to submit a bid.
☐	**NO**. We are unable to submit a competitive offer for the requested goods/works/services at the moment

If you selected NO above, please state the reason(s) below:

Check applicable	Description
☐	The requested goods/services are not within our range of supply
☐	We are unable to submit a competitive offer for the requested products at the moment
☐	The requested products are not available at the moment
☐	We cannot meet the requested specifications
☐	We cannot offer the requested type of packing
☐	We can only offer FCA prices
☐	The information provided for bidding purposes is insufficient
☐	Your ITB is too complicated
☐	Insufficient time is allowed to prepare a bid
☐	We cannot meet the delivery requirements
☐	We cannot adhere to your terms and conditions e.g. payment terms, request for performance security, etc.. Please provide details below.
☐	Sustainability criteria/requirements are too stringent (if applicable)
☐	We do not export
☐	We do not sell to the UN
☐	Your volume is too small and does not meet our order quantity
☐	Our production capacity is currently full
☐	We are closed during the holiday season
☐	We had to give priority to other clients' requests
☐	We do not sell directly but through distributors
☐	We have no after-sales service available
☐	The person handling the bids is away from the office
☐	Other (please provide reasons below):
Further information: Click or tap here to enter text.	
☐	We would like to receive future ITBs for this type of goods
☐	We don't want to receive ITBs for this type of goods

Questions to the bidder concerning the reasons for NO BID should be addressed to Click or tap here to enter text. phone Click or tap here to enter number., email Click or tap here to enter text..

FORM B: CHECKLIST

This form serves as a checklist for preparation of your bid. Please complete the returnable bidding forms in accordance with the instructions and return them as part of your bid submission: No alteration to the format of forms shall be permitted and no substitution shall be accepted.

Before submitting your bid, please ensure compliance with the instructions in Section 2: Instructions to Bidders and Section 3: Data Sheet.

Technical bid:

Have you duly completed all the returnable bidding forms?	
- Form C: Bid Submission	☒
- Form D: Bidder Information	☒
- Form E: Joint Venture/Consortium/Association Information	☒
- Form F: Eligibility and Qualification	☒
- Form G: Technical Bid/Bill of Quantities	☒
Have you provided the required documents to establish compliance with the evaluation criteria in Section 4?	☐
Have you provided the required documents in support of Form D: Bidder Information?	☐

Price Schedule:

- Form H: Price Schedule	☐

To meet the minimum requirement, Bidders are requested to fill in the following sections of the Returnable Bidding Forms. Additional submitted documents may be helpful for review, but it is expected that the sections of the Returnable Forms are properly filled to allow a structured bid evaluation.

FORM C: BID SUBMISSION

Name of bidder:	Click or tap here to enter text.	Date:	Click or tap to enter a date.
ITB reference:	LBN-CO-ITB-6-24		

We, the undersigned, offer to supply the goods and related services required for Click or tap here to enter text.in accordance with your Invitation to Bid No. Click or tap here to enter text.. We hereby submit our bid, which includes

The discounts offered and the methodology of their application are:

a. **Discounts:** If our bid is accepted, the following discounts shall apply Specify in detail each discount offered and the specific item of the Schedule of Requirement to which it applies, including if applicable discounts for accelerated payment.
b. **Methodology of application of the discounts:** The discounts shall be applied using the following method: Specify in detail the method that shall be used to apply the discounts

Bidder Declaration: on behalf of our firm, its affiliates, subsidiaries and employees, including any JV / Consortium / Association members or subcontractors or suppliers for any part of the contract.

Yes	No	
☐	☐	**Requirements and Terms and Conditions:** I/We have read and fully understand the ITB, including the ITB Information and Data Sheet, Schedule of Requirements, the General Conditions of Contract and any Special Conditions of Contract. I/we confirm that the bidder agrees to be bound by them.
☐	☐	I/We confirm that the bidder has the necessary capacity, capability and necessary licenses to fully meet or exceed the requirements and will be available to deliver throughout the relevant contract period.
☐	☐	**Ethics**: In submitting this bid I/we warrant that the bidder: has not entered into any improper, illegal, collusive or anti-competitive arrangements with any competitor; has not directly or indirectly approached any representative of the buyer (other than the point of contact) to lobby or solicit information in relation to the ITB; has not attempted to influence, or provide any form of personal inducement, reward or benefit to any representative of the buyer.
☐	☐	I/We confirm to undertake not to engage in proscribed practices, or any other unethical practice, with the UN or any other party, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the UN and we have read the United Nations Supplier Code of Conduct :https://www.un.org/Depts/ptd/about-us/un-supplier-code-conduct and acknowledge that it provides the minimum standards expected of suppliers to the UN.
☐	☐	**Conflict of interest:** I/We warrant that the bidder has no actual, potential or perceived conflict of Interest in submitting this bid, or entering into a contract to deliver the requirements. Where a conflict of interest arises during the ITB process the bidder will report it immediately to the Procuring Organisation's Point of Contact.
☐	☐	**Prohibitions, Sanctions:** I/We hereby declare that our firm, its affiliates or subsidiaries or employees, including any JV/Consortium members or subcontractors or suppliers for any part of the contract is not under procurement prohibition by the United Nations, including but not limited to prohibitions derived from the Compendium of United Nations Security Council Sanctions Lists and have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any UN Organization or the World Bank Group.
☐	☐	I/We do not employ, or anticipate employing, any person(s) who is, or has been a UN staff member within the last year, if said UN staff member has or had prior professional dealings with our firm in his/her capacity as UN staff member within the last three years of service with the UN (in accordance with UN post-employment restrictions published in ST/SGB/2006/15);
☐	☐	**Bankruptcy**: I/We have not declared bankruptcy, are not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against them that could impair their operations in the foreseeable future.

Yes	No	
☐	☐	**Bid Validity Period:** I/We confirm that this bid, including the price, remains open for acceptance for the bid validity period.
☐	☐	I/We understand and recognize that you are not bound to accept any bid you receive and we certify that the goods offered in our bid are new and unused.
☐	☐	By signing this declaration, the signatory below represents, warrants and agrees that he/she has been authorised by the Organisation/s to make this declaration on its/their behalf.

Name: _____

Title: _____

Date: _____

Signature: _____

[*Stamp with official stamp of the bidder*]

FORM D: BIDDER INFORMATION

ITB Reference	LBN-CO-ITB-6-24
Legal name of bidder	Click or tap here to enter text.
Legal Address, City, Country	Click or tap here to enter text.
Website	Click or tap here to enter text.
Year of registration	Click or tap here to enter text.
Bidder's Authorized Representative information	Name and Title: Click or tap here to enter text. Telephone numbers: Click or tap here to enter text. Email: Click or tap here to enter text.
Legal structure	Choose an item.
Organisational type	Choose an item.
Current Licenses, if any, and permits (with dates, numbers and expiration dates)	Click or tap here to enter text.
No. of full-time employees	Click or tap here to enter number.
No. of staff involved in similar supply contracts	Click or tap here to enter number.
Are you a UNGM registered vendor?	☐ Yes ☐ No If yes, insert UNGM Vendor Number
Years of supplying to UN organisations	Click or tap here to enter text.
Are you a UNDP vendor?	☐ Yes ☐ No If yes, insert Vendor Number
Countries of operation	Click or tap here to enter text.
Subsidiaries in the region (please indicate names of subsidiaries and addresses, if relevant to the bid)	Click or tap here to enter text.
Commercial Representatives in the country: Name/Address/Phone (for international companies only)	Click or tap here to enter text.
Quality Assurance Certification (e.g. ISO 9000 or Equivalent) *(If yes, provide a Copy of the valid Certificate):*	Click or tap here to enter text.
Presence and characteristics of in-house quality control laboratory (if relevant to bid)	Click or tap here to enter text.

Does your Company have a corporate environmental policy or environmental management system such as ISO 14001 or ISO 14064 or equivalent?	Tick all that apply and **provide supporting documentation.** ☐ Corporate Environmental Policy ☐ ISO 14001 ☐ ISO 14064 ☐ Other, specify Click or tap here to enter text.
Does your organization demonstrate significant commitment to sustainability, including the following aspects that have been identified in the UN Sustainable Procurement Framework? - **Environmental: prevention of pollution, sustainable resources; climate change and mitigation and the protection of the environment, biodiversity.** - **Social: human rights and labour issues, gender equality, sustainable consumption, and social health and wellbeing.** - **Economic: whole life cycle costing, local communities and small or medium enterprises, and supply chain sustainability.**	Attach a formal statement that outlines your organisation's commitment to sustainability, where possible providing evidence of tangible results that demonstrate progress such as: Tick all that are attached: ☐ Formal statement ☐ Sustainability report ☐ UN Global Compact Communication on Progress ☐ Other, specify Click or tap here to enter text.
Does your company belong to a diverse supplier group including micro, small or medium sized enterprise, women or youth owned business or other? *(If yes, please provide details and documentation]*	Click or tap here to enter text.
Is your company a member of the UN Global Compact	Choose an item. If yes, please provide a link to your Global Compact profile: Click or tap here to enter text.
Bank Information	Bank Name: Click or tap here to enter text. Bank Address: Click or tap here to enter text. IBAN: Click or tap here to enter text. SWIFT/BIC: Click or tap here to enter text. Account Currency: Click or tap here to enter text. Bank Account Number: Click or tap here to enter text.
Contact person that Click or tap here to enter text. **may contact for requests for clarifications during bid evaluation**	Name and Title: Click or tap here to enter text. Telephone numbers: Click or tap here to enter text. Email: Click or tap here to enter text.
Please attach the following documents:	As indicated in Stage 2 of Evaluation under Section 4

FORM E: JOINT VENTURE/CONSORTIUM/ASSOCIATION INFORMATION

Name of bidder:	Click or tap here to enter text.	Date:	Click or tap to enter a date.
ITB reference:	LBN-CO-ITB-6-24		

To be completed and returned with your bid if the bid is submitted as a Joint Venture/Consortium/Association.

No	**Name of Partner and contact information** *(address, telephone numbers, fax numbers, e-mail address)*	**Proposed proportion of responsibilities (in %) and type of goods, works and/or services to be performed**
1	Click or tap here to enter text.	Click or tap here to enter text.
2	Click or tap here to enter text.	Click or tap here to enter text.
3	Click or tap here to enter text.	Click or tap here to enter text.

Name of leading partner (with authority to bind the JV, Consortium, Association during the ITB process and, in the event a Contract is awarded, during contract execution)	Click or tap here to enter text.

We have attached a copy of the below referenced document signed by every partner, which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture:

☐ Letter of intent to form a joint venture ***OR*** ☐ JV/Consortium/Association agreement

We hereby confirm that if the contract is awarded, all parties of the Joint Venture/Consortium/Association shall be jointly and severally liable to Click or tap here to enter text for the fulfilment of the provisions of the Contract.

Name of partner: _____

Signature: _____

Date: _____

Name of partner: _____

Signature: _____

Date: _____

Name of partner: _____

Signature: _____

Name of partner: _____

Signature: _____

Date: _____ Date: _____

FORM F: ELIGIBILITY AND QUALIFICATION FORM

Name of bidder:	Click or tap here to enter text.	Date:	Click or tap to enter a date.
ITB reference:	LBN-CO-ITB-6-24		

If JV/Consortium/Association, to be completed by each partner.

History of Non- Performing Contracts

☐No non-performing contracts during the last 3 years			
☐ Contract(s) not performed in the last 3 years			
Year	**Non- performed portion of contract**	**Contract Identification**	**Total Contract Amount** (current value in US$)
		Name of Client: Address of Client: Reason(s) for non-performance:	

Litigation History (including pending litigation)

☐ No litigation history for the last 3 years			
☐ Litigation History as indicated below			
Year of dispute	**Amount in dispute** (state currency)	**Contract Identification**	**Total Contract Amount** (state currency)
		Name of Client: Address of Client: Matter in dispute: Party who initiated the dispute: Status of dispute: Party awarded if resolved:	

Previous Relevant Experience

Please list only previous similar assignments successfully completed in the last 10 years.

List only those assignments for which the bidder was legally contracted or sub-contracted by the Client as a company or was one of the Consortium/JV partners. Assignments completed by the bidder's individual experts working privately or through other firms cannot be claimed as the relevant experience of the bidder, or that of the bidder's partners or sub-consultants, but can be claimed by the Experts themselves in their CVs. The bidder should be prepared to substantiate the claimed experience by presenting copies of relevant documents and references if so requested.

Project name & Country of Assignment	**Client & Reference Contact Details**	**Contract Value**	**Period of activity and status**	**Types of activities undertaken and role (Contractor, sub-contractor or consortium member)**

Bidders may also attach their own Project Data Sheets with more details for assignments above.

☐ Attached are the Statements of Satisfactory Performance from the Top 3 (three) Clients or more.

Financial Standing

Annual Turnover for the last 3 years	Year	Currency	Amount
	Year	Currency	Amount
	Year	Currency	Amount
Latest Credit Rating (if any), indicate the source and date.			

Financial information (state currency)	**Historic information for the last 3 years**		
	Year 1	Year 2	Year 3
	Information from Balance Sheet		
Total Assets (TA)			
Total Liabilities (TL)			
Current Assets (CA)			
Current Liabilities (CL)			
	Information from Income Statement		
Total / Gross Revenue (TR)			
Profits Before Taxes (PBT)			
Net Profit			
Current Ratio (current assets/current liabilities)			

☐ Attached are copies of the audited financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following condition:

- Must reflect the financial situation of the bidder or party to a JV, and not sister or parent companies;
- Historic financial statements must be audited by a certified public accountant;
- Historic financial statements must correspond to accounting periods already completed and audited. No statements for partial periods shall be accepted.

FORM G: TECHNICAL BID

Name of bidder:	Click or tap here to enter text.	Date:	Click or tap to enter a date.
ITB reference:	LBN-CO-ITB-6-24		

The Bidder's Bid should be organized to follow this format of the Technical Bid. Where the bidder is presented with a requirement or asked to use a specific approach, the bidder must not only state its acceptance, but also describe how it intends to comply with the requirements. Where a descriptive response is requested, failure to provide the same will be viewed as non-responsive.

SECTION 1: Bidder's qualification, capacity and expertise

General organizational capability which is likely to affect implementation: management structure, financial stability and project financing capacity, project management controls, extent to which any work would be subcontracted (if so, provide details).

Relevance of specialized knowledge and experience on similar engagements done in the region/country.

Quality assurance procedures and risk mitigation measures.

Organization's commitment to sustainability.

SECTION 2: Scope of Supply, Technical Specifications, and Related Services

This section should demonstrate the Bidder's responsiveness to the specification by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; and demonstrating how the proposed bid meets or exceeds the requirements/specifications. All important aspects should be addressed in sufficient detail.

A detailed description of how the Bidder will deliver the required goods and services, keeping in mind the appropriateness to local conditions and project environment. Details how the different service elements shall be organized, controlled and delivered.

Explain whether any work would be subcontracted, to whom, how much percentage of the requirements, the rationale for such, and the roles of the proposed sub-contractors and how everyone will function as a team.

The bid shall also include details of the Bidder's internal technical and quality assurance review mechanisms.

Implementation plan including a Gantt Chart or Project Schedule indicating the detailed sequence of activities that will be undertaken and their corresponding timing.

Demonstrate how you plan to integrate sustainability measures in the execution of the contract.

Goods, works and/or services to be Supplied and Technical Specifications	Bidder's response				
	Compliance with technical specifications		Delivery Date *(confirm that you comply or indicate your delivery date)*	Quality Certificate/Export Licenses, etc. *(indicate all that apply and attach)*	Comments
	Yes, we comply	**No, we cannot comply** *(indicate discrepancies)*			

Other Related services and requirements *(based on the information provided in Section 5)*	**Compliance with requirements**		**Details or comments on the related requirements**
	Yes, we comply	**No, we cannot comply** *(indicate discrepancies)*	
e.g. Delivery Term			
Warranty			
Local Service Support			

SECTION 3: Management Structure and Key Personnel

Describe the overall management approach toward planning and implementing the project. Include an organization chart for the management of the project describing the relationship of key positions and designations. Provide a spreadsheet to show the activities of each personnel and the time allocated for his/her involvement.

Provide CVs for key personnel that will be provided to support the implementation of this project using the format below. CVs should demonstrate qualifications in areas relevant to the scope of goods and/or services.

Format for CV of Proposed Key Personnel

Name of Personnel	[Insert]
Position for this assignment	[Insert]
Nationality	[Insert]
Language proficiency	[Insert]
Education/ Qualifications	*[Summarize college/university and other specialized education of personnel member, giving names of schools, dates attended, and degrees/qualifications obtained.]*
	[Insert]
Professional certifications	*[Provide details of professional certifications relevant to the scope of goods and/or services]*

	☐ Name of institution: [Insert] ☐ Date of certification: [Insert]
Employment Record/ Experience	*[List all positions held by personnel (starting with present position, list in reverse order), giving dates, names of employing organization, title of position held and location of employment. For experience in last five years, detail the type of activities performed, degree of responsibilities, location of assignments and any other information or professional experience considered pertinent for this assignment.]*
	[Insert]
References	*[Provide names, addresses, phone and email contact information for two (2) references]*
	Reference 1: [Insert] Reference 2: [Insert]

I, the undersigned, certify that to the best of my knowledge and belief, the data provided above correctly describes my qualifications, my experiences, and other relevant information about myself.

_____ _____

Signature of Personnel Date (Day/Month/Year)

FORM H: PRICE SCHEDULE

Name of bidder:	Click or tap here to enter text.	Date:	Click or tap to enter a date.
ITB reference:	LBN-CO-ITB-6-24		

Bidders shall fill in these Price Schedule Forms in accordance with the instructions indicated. The Price Schedule must include a detailed cost breakdown of all goods and related services to be provided. Separate figures must be provided for each functional grouping or category, if any.

Any estimates for cost-reimbursable items, such as travel of experts and out-of-pocket expenses, should be listed separately.

Bid Summary:

Summary	**Total Cost USD**
Supply, Installation, Commissioning, and Provision of Operation and Maintenance Support of a Hybrid Solar PV diesel System at TAYYEBAT facility in Insariyeh, South Lebanon, Lebanon	
Subtotal DDP Price in USD (excluding VAT)	
VAT 11% (if applicable)*	
Grand Total (including VAT)	

(In addition to the above table, Bidders shall include their proposed detailed prices within the BOQs attached to this ITB, and duly sign and submit these completed BOQs within their offer as pdf file.

Please make sure to attach the BOQ including the prices proposed in EXCEL form without removing any lines or columns for evaluation purposes.

Note: The VAT will be paid in LBP based on the Government circular regarding the VAT. Even if a bidder quotes VAT in USD, the payment will be processed as mentioned above.

Compliance with Requirements

	You Responses		
	Yes, we will comply	**No, we cannot comply**	**If you cannot comply, pls. indicate counter - offer**
Minimum Technical Specifications (As listed in Annex 1)	☐	☐	Click or tap here to enter text.
Delivery Term (DDP INCOTERMS)	☐	☐	Click or tap here to enter text.
Delivery Lead Time (4 months)	☐	☐	Click or tap here to enter text.
Validity of Quotation (120 days)	☐	☐	Click or tap here to enter text.
Payment terms (as indicated in the Section 2)	☐	☐	Click or tap here to enter text.
Other requirements *[pls. specify]*	☐	☐	Click or tap here to enter text.

I, the undersigned, certify that I am duly authorized by Click or tap here to enter text. to sign this bid and bind Click or tap here to enter text.should Click or tap here to enter text.accept this bid:

Name : _____

Title : _____

Date : _____

Signature : _____