Request for Proposals (RFP) for the Implementation of Renewable Energy & Energy Efficiency (REEE) Measures in Twenty One (21) Public Schools in Lebanon

Sustainable Facility Management at Public Schools in Lebanon (SUFA) project.
Funded by the German Federal Ministry for Economic Cooperation Development (BMZ) under the education portfolio of GIZ Lebanon.

May 2023
Prepared by the Lebanese Center for Energy Conservation (LCEC)
Beirut, Lebanon

The Lebanese Center for Energy Conservation (LCEC) reserves the right to request additional information to be added to the RFP.

Should any company interested in submitting a proposal fail to provide its contact details to the LCEC, the LCEC shall not be responsible if such company fails to receive any updates to this document or clarifications relating thereto.

May 2023 - Beirut, Lebanon

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Abbreviations

CD	Compact Disk
BoQ	Bill of Quantities
EDL	Electricité du Liban
IEC	International Electro-technical Commission
kWh	Kilowatt Hour
kW	Kilowatt
kWp	Kilowatt Peak
LCEC	Lebanese Center for Energy Conservation
LED	Light-emitting diode
MEW	Ministry of Energy and Water
MW	Megawatt
MWh	Megawatt Hour
PDF	Portable Document Format
PV	Photovoltaic
RFP	Request for Proposal
USD	United States Dollars
CE	European conformity mark
NL	Lebanese conformity mark
IEC	International Electrotechnical Commission

A. Background Information

1. Back-up diesel generators have been operating in communities to cover the shortages in electricity supply.

2. Moreover, due to the increase in fuel costs, securing diesel to run these back-up generators is becoming challenging, not to forget about the resulting high levels of noise and air pollution.

3. With a shortage in electricity supply that exceeds 20 hours per day, running diesel generators for long durations has resulted in recurrent technical failures.

4. All these challenges are affecting the reliability of electricity supply and disrupting the socio-economic sectors and in particular, schooling activities. For instance, long electricity outages are leaving the students without access to basic learning necessities, such as classroom lighting and internet.

5. In addition, the school's management is becoming financially incapable of covering the diesel and electricity bills, which is affecting the budget allocation for the operation and renovation of facilities.

6. Here comes the urgent need to integrate renewable energy and energy efficiency solutions to increase energy security, energy reliability, and energy affordability, and to ensure access to adequate electricity and by that access to water, internet services and most important access to education.

7. In the meantime, and due to the high demand for solar energy, ongoing installations are not necessarily following the best practices. This highlights a greater need for capacity building and knowledge sharing to properly assess and implement energy efficiency measures that would respond to current and future needs.

8. Among its responsibilities, a main aspect of LCEC's momentum is in updating the local context in line with global trends and the latest innovations, aligning national

efforts, and reaching out to the largest share of the public for awareness raising and professionals for capacity building.

9. LCEC is an independent organization within the Ministry of Energy and Water in Lebanon. It is a technical point of reference specialized in renewable energy and energy efficiency.

10. LCEC works on setting national strategies and action plans to be adopted by the Lebanese Government and on the implementation and quality control of national projects and initiatives in the country. LCEC is also involved in the update and development of the legal and administrative framework needed for the greening of the energy sector.

11. For more information please refer to the following website: http://lcec.org.lb/en/LCEC

12. The overall objective of the SUFA project is to reduce the environmental footprint and to keep the schools operational, in line with SUFA project's general goal to improve the school conditions for Lebanese children and Syrian refugee children in the host communities.

13. The specific objectives of the project are the following:

SO1. To ensure sustainable access to electricity for school students, teachers, and administrators in the targeted areas

SO2. To strengthen the capacities of schools and MEHE's resources in the energy field

SO3. To contribute to environmental protection, climate change adaptation and mitigation through improved energy management of public schools' buildings and execution of green school measures.

SO4. To reduce the energy consumption in public schools and increase energy security and affordability through the implementation of cost-effective renewable energy and energy efficiency solutions, tailored to specific sites conditions

SO6. To increase awareness and sustainable energy habits through the engagement of students and staff in the operation and use of REEE systems

SO7. To reduce the environmental footprint and operating cost of public schools through the implementation of eco-friendly and environmental measures under Green Schools component.

14. As part of the contract signed between GIZ and LCEC, the LCEC is acting closely with the GIZ SUFA team to implement different solutions related to renewable energy and energy efficiency in public schools.

15. With the implementation of the Renewable Energy and Energy Efficiency (REEE) measures at public schools, this project would contribute to the solar photovoltaic distributed generation by the public sector by adding around 430 kWp, which represents around 9% of the 5 MW target in the public sector, in addition to the reduction of around 550 tCO2eq of GHG emissions.

16. The objective of this Request for Proposal (RFP) is for the Lebanese Center for Energy Conservation (LCEC) to select contractors to procure and install twenty one (21) REEE projects utilizing a contract agreement.

B. Important Notes

17. The bid is divided on four (4) main lots. Each bidder shall send a proposal for each lot separately. A bidder may apply for a maximum of two (2) lots out of four (4).

18. The intent is to contract one qualified bidder for each lot for the supply and installation of the systems and products subject of this RFP, under the Sustainable Facility Management at Public Schools in Lebanon (SUFA) project.

19. The winning bidder (s) will be referred to as "contractor" in the following sections.

20. The REEE component of the SUFA project include the installation of the following measures in 21 public schools:

    - Solar PV systems with energy storage.
    - Solar drive inverters for water pumping
    - LED lighting retrofits.
    - Indoor air quality sensors.
    - Weather stations.

21. SUFA project has procured most of the energy items for the implementation of the REEE component. All the solar drive inverters, LED lights, indoor air quality sensors, and weather stations are procured by the project.

22. Energy items related to the solar PV with energy storage systems are not fully procured by the project.

23. All the datasheets of the procured items are found in Annex 6. All products that shall be supplied by the winning bidders shall be according to the technical specifications mentioned in Annex 4.

24. The procured quantities of energy items are not equally distributed on all schools. Not all measures shall be implemented in the 21 schools.

25. The LCEC team developed the design for the solar PV systems based on items procured by SUFA project, and the contractor shall supply (where needed) and properly install these systems according to the proposed design. The proposed design is found in Annex 2.

26. The solar drive inverters shall be installed according to the proposed design in this RFP.

27. The BoQs listed in Annex 3 show the distribution of REEE measures in each school.

28. The deadline for the request for clarifications is on May 30 at 03:00 p.m. All requests for clarifications shall be submitted **ONLY by email** to: energy@lcec.org.lb using "RFC-RFP for the Implementation of REEE Measures in 21 Public Schools in Lebanon" as subject title.

29. Site visits will be conducted to inspect the installation areas of the public schools. The site visits schedule to all schools is shared in Annex 1.

30. Proposal is due on the 2nd of June at 3:00 p.m. All proposals received after the mentioned date and time will be rejected.

31. The contractor is expected to hand-over the project One (1) month starting from the date of contract signature.

32. LCEC may, at its discretion, extend the deadline for the submission of proposals, in which case all rights and obligations of LCEC and the applicants subject to the previous deadline shall thereafter be subject to the deadline as extended.

33. Financial proposals shall be submitted in USD ($) including VAT.

34. Proposals must be delivered to the LCEC offices at the following address: Ministry of Energy and Water (MEW), Corniche du Fleuve, 1st Floor, Room 303.

35. Proposals shall be in two (2) envelopes: Envelope (1) contains the Administrative, Capabilities and Technical Proposal and Envelope (2) contains the Financial Offer. The proposal shall be valid for 180 days from the proposal due date.

36. All information included in all the pages of this document and its annexes is an integral part of this Request for Proposal (RFP).

37. For all questions, comments, suggestions, and clarifications regarding this proposal, communicate with LCEC **ONLY by email** to: energy@lcec.org.lb.

C. Scope of the Proposal

Under the supervision of LCEC:

38. The contractor shall transport the procured energy items from LCEC's warehouse located in Roumieh to the corresponding schools. All safety measures of Annex 5 shall be followed to ensure a safe transportation and installation of all energy items.

39. The contractor shall survey, supply (where needed), build, test, and commission the items and services included in the BoQs listed in Annex 3, and in general be responsible for all aspects related to the good operation of the implemented measures.

40. The contractor shall be responsible for any necessary additional electrical and civil works if needed, all necessary connections to the existing facilities, and eventually all types of auxiliaries to export the excess of energy into the national grid as per the electrical design and the grid requirements of "Electricité du Liban" (EDL).

41. The contractor shall use high quality, commercially viable power equipment technologies, where needed, that are certified as per international standards. In addition, contractor shall use equipment that is widely deployed around the world in the solar industry and possesses a proven track record of reliability.

42. The contractor shall comply with the most recent version of standards for all work, equipment and materials. The following standards are provided as a guideline: IEC standards, CE standards, and NL standards. The contractor shall comply with all applicable Lebanese laws and regulations, and future amendments.

43. In the financial offer, the bidder shall include a price list for all the items and services required for the implementation of the REEE component included in the BOQs listed in Annex 3 of this RFP.

44. The contractor shall commit for the replacement of components he procured in the event of their failure during the warranty period, or in case of failure during the

contractor's liability period of any equipment related to the REEE component already procured by the project, damaged due to the improper installation or commissioning by the contractor. No payment will be affected if the defected component, procured by the contractor, is still under the manufacturer warranty.

45. The contractor shall conduct a training of operators in each school after the commissioning of the systems.

46. The contractor shall be responsible of the Operation and Maintenance (O&M) of systems for a period of one (1) year, following the issuing of the Provisional Acceptance Certificate by LCEC. The Final Acceptance Certificate will be issued by LCEC following the one (1) year of O&M.

47. Site visits will be conducted to inspect the installation areas of the public schools. The site visits schedule to all schools is shared in Annex 1.

48. Locations of the facilities are divided into four (4) main lots as per Annex 1 of this RFP.

D. Instructions to Bidders

49. Interested bidders are required to read carefully all the information in all the sections: abbreviations; important notes; background of the project; scope of the REEE installation works; instructions to bidders; evaluation process and scoring method; qualification criteria- stage 1; technical scoring- stage 2; general terms and conditions; miscellaneous term and conditions; general conditions of contract; forms section; and the annexes.

50. The deadline for submission of proposals is the 2nd of June at 3:00 p.m. All proposals received after the mentioned date and time will be rejected.

51. Proposals must be delivered to the LCEC offices at the following address: Ministry of Energy and Water (MEW), Corniche du Fleuve, 1st Floor, Room 303, Beirut- Lebanon. Proposals may be hand delivered or sent by courier to the mentioned address.

52. The bidder will submit its proposal in two parts. The first part will contain the entire proposal except the financial proposal. The second part will contain only the financial proposal.

53. The bidder shall prepare one (1) copy of the proposal. The copy of the proposal shall be typed or written in indelible ink and shall be signed by the bidder or a person or persons duly authorized to bind the bidder to the contract. The latter authorization shall be indicated by written power-of-attorney accompanying the proposal. In the event of any discrepancy between the original and the copy, the original shall prevail.

54. A proposal shall contain no interlineations, erasures, or overwriting except, as necessary to correct errors made by the bidder, in which case such corrections shall be initiated by the person or persons signing the proposal.

55. The bidder shall submit a CD containing a digital copy of the entire proposal (except the financial offer) as one searchable document in PDF format. The CD must be clearly marked to indicate the name of the bidder and the statement "Proposal for

Implementation of Renewable Energy & Energy Efficiency (REEE) Measures in Twenty One (21) Public Schools in Lebanon".

56. The bidder shall seal the proposal in one (1) outer envelope including two (2) inner sealed envelopes and the CD as detailed below.

57. The back of the outer envelope shall be clearly marked with "Proposal for Implementation of Renewable Energy & Energy Efficiency (REEE) Measures in Twenty One (21) Public Schools in Lebanon" as well as the name of the bidder. The outer envelope shall be addressed to: "Lebanese Center for Energy Conservation (LCEC), Ministry of Energy and Water (MEW), Corniche du Fleuve, 1st Floor, Room 303, Beirut- Lebanon, phone: 00961 1 565108".

58. The two (2) inner envelopes must be sealed.

59. One (1) of the inner envelopes shall contain all the information specified in the RFP except the financial offer. This envelope must be marked on its back with "Operational and Technical Proposal". The operational and technical part of the proposal should not contain any pricing information whatsoever on the services offered.

60. The other one (1) inner envelope shall contain the financial offer for the project. This envelope must be marked on its back with "Financial Offer".

61. If any of the envelopes are not sealed and marked as required, LCEC will assume no responsibility for the misplacement of the proposal or its premature opening.

62. Failure of the bidder to abide by the requirements of this section might lead to the rejection of the proposal.

63. The technical proposal must clearly include five (5) sub-sections: the official and administrative signed papers, the management and resource plan, the proposed methodology, the team composition and tasks assignment, and an unpriced detailed bill of quantities (BoQ) according to the BoQs listed in Annex 3.

64. The official and administrative signed papers sub-section should include all the official papers of the bidder, especially those needed for the qualification stage described later on. This sub-section should also include all the needed forms mentioned in the forms section later on.

65. The management and resource plan section should provide corporate orientation to include the year and state/country of incorporation and a brief description of the bidder's present activities. It should focus on services related to the proposal.

66. The management and resource plan section should also describe the organizational unit(s) that will become responsible for the contract, and the general management approach towards a project of this kind. The bidder should comment on its experience in similar projects and identify the person(s) representing the bidder in any future dealing with the LCEC.

67. The management and resource plan section should fully explain the bidder's resources in terms of personnel and facilities necessary for the performance of this requirement. It should describe the bidder's current capabilities/facilities and any plans for their expansion.

68. The proposed methodology section should demonstrate where needed the bidder's responsiveness to the specifications by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed warranty; and demonstrating how the proposed methodology meets or exceeds the specifications.

69. It is mandatory that the proposal numbering system corresponds with the numbering system used in the body of this RFP. All references to descriptive material and brochures should be included in the appropriate response paragraph, though material/documents themselves may be provided as annexes to the proposal/response.

70. The team composition and task assignment section should include the CV's of the key personnel and their key qualifications, as well as the assignment(s) dedicated to each of the personnel.

71. The bid must include clear detailed bills of quantities (BOQs) of all the products and quantities according to the BoQs listed in Annex 3. All BOQs shall be included in the technical proposal without any pricing.

72. The same detailed BOQs shall be included in the financial offer envelope including the pricing.

E. Required Deliverables

73. The professional assignment shall include the tasks mentioned in the following points.

74. LCEC shall always be informed about any activity initiation or progress on site by email.

75. The contractor's site supervisor shall always be present on site during the implementation of activities.

76. LCEC may ask for progress reports to be submitted throughout the period of the contract, identifying potential risks, signaling any delays in deliverables, and providing updates on relevant components and activities.

77. The reports should be comprehensive and written in proper prose. The language should be clear, concise and understandable.

78. International System of Units (SI) must be used in all parts of the reports.

79. All calculations in the submitted reports should be checked for mathematical accuracy.

80. The expected deliverables are provided in the table below.

Table 1: List of Deliverables

Deliverable 1	Report of project working plan with time schedule and Gantt chart for the execution & documentation of the works.
Deliverable 2	On-site supply and delivery of components.
Deliverable 3	REEE measures – Part 1: Completion of installation of solar drive inverters, LED light retrofit, indoor air quality sensors, and weather stations as per the BoQs listed in Annex 3.
Deliverable 4	REEE measures – Part 2: Completion of installation of solar PV systems with energy storage as per the BoQs listed in Annex 3.
Deliverable 5	Completion of "General Items" installation/submission as per the BoQs listed in Annex 3.
Deliverable 6	Acceptance tests performed, punch list completed, and performance tests conducted.
Deliverable 7	One (1) year O&M for the twenty one (21) schools.

F. Evaluation Process and Scoring Method

81. A four-stage procedure is utilized in evaluating the proposals, with evaluation of the technical proposal being completed prior to any price proposal being opened and compared.

82. The proposal will undergo a four-stage evaluation:

    a. Stage 1: Administrative and Technical Qualification (Pass/Fail);
    b. Stage 2: Capability and Technical Scoring;
    c. Stage 3: Financial Offer Comparison;
    d. Stage 4: Negotiation.

83. In case the winning bidder does not sign the contract within 30 days of the announcement of the award, then the LCEC reserves the right to disqualify the winning bidder and choose the next bidder. The disqualified bidder will forfeit the bid deposit.

84. Stage 1 evaluation will be based on the qualification criteria described in the following section here below. The evaluation committee will reject proposals that do not meet all the qualification criteria in stage 1.

85. All proposals that pass stage 1 evaluation will be scored in stage 2 based on the capability and technical scoring. At this stage, the financial proposal will not be opened. Companies that score 70 or higher out of a score of 100 (technical score, St) will be selected to move to stage 3.

86. If the number of proposals that possess a score of 70 or higher is less than 3, then the top three proposals will be selected to move to stage 3 regardless of the score.

87. In stage 3, the financial proposal of the bidders selected in stage 2 will be opened and subsequently compared.

88. The formula for determining the financial scores is the following:

89. Sf = 100 x Fm/F, in which
Sf is the financial score,
Fm is the lowest price
and F the price of the proposal under consideration.

90. The Total Score for each proposal will be calculated independently by formula:
TS = St x 0.7 + Sf x 0.3
TS is the total score of the proposal under consideration;
St is technical score of the proposal under consideration;
Sf is financial score of the proposal under consideration.

91. The bidder with the highest Total Score (TS) will be selected to proceed to signing of the contract.

92. The evaluation committee to be assigned by the LCEC will use the mentioned scoring method. It reserves the right to change, modify or enhance the evaluation criteria and the scoring method. Full scores will be given only if all the requested information is provided.

93. The evaluation committee reserves the right to disqualify bidders that provide conflicting, contradictory, implausible (technical data or calculation) or in any other way misleading information.

94. The LCEC reserves the right to negotiate the proposed financial offer with the selected bidder before signing the contract.

G. Qualification Criteria

95. All bids must meet all the following qualification criteria (items 96 to 113 below). Compliance with all the qualification criteria is mandatory. If any one of all the requested mandatory qualification criteria (and sub-criteria) is not met by the bid, then the whole bid will be rejected (PASS/FAIL).

96. All the pages of this RFP, its addendums and clarifications should be included in the proposal, signed and stamped.

97. The proposal must clearly include five (5) sub-sections: the official and administrative signed papers, the management and resource plan, the proposed methodology, the team composition and tasks assignment, and detailed bills of quantities (BOQs) according to the BoQs listed in Annex 3.

98. All forms mentioned in the forms sections should be clearly filled, signed, and stamped.

99. The forms submitted by the bidder shall be in conformance with the provided sample forms (Forms 1 to Forms 11). Any alternate form/text in any of the forms, would result in the rejection of the bid.

100. The signed application form should be clearly filled, signed, and stamped.

101. The power of attorney (notarized) should be provided, signed and stamped. The power of attorney should authorize the person signing the application form to act as a representative (or representatives) on behalf of the bidder (or joint venture members) to submit the proposal.

102. The bidder's commercial registration (or equal) should be provided, signed, and stamped.

103. The proposal bid must include clear detailed bill of quantities (BOQs) of all the products according to the BoQs listed in Annex 3. The BOQs shall be included in the technical proposal without any pricing.

104. The reference or model numbers of the proposed products must be clearly included in the BOQs where applicable.

105. Bid bond: the technical proposal shall be accompanied by a bid bond made payable in cash to the LCEC to the amount of 7,000 USD. The bid bond shall be drawn in a manner acceptable to the LCEC.

106. General company eligibility: the bidding company shall fill all the requirements in the Applicant(s) Information Form, and submit all the required documentation related to eligibility.

107. Past performance: the bidder shall have at least 200 kWp of solar PV projects with energy storage that are in operation and have reached financial closure before March 2023.

108. Team leader: the bidder shall assign a team leader with at least 5 years of experience in the energy sector.

109. Project completion date: the completion date for the project must not exceed 1 month following contract signature (commissioned and in production).

110. Capacity of the project: the proposal shall include the implementation of all REEE measures indicated in this RFP.

111. Location of the Plant: the bidding company shall abide by the space allocated for the project at the locations of the schools subject of this RFP.

112. The proposed methodology should include the following minimum information:
    a. Timeline/project schedule;
    b. System description;

c. Equipment details and description where applicable;
d. Selection of key equipment where applicable;
e. Specifications for equipment procurement and installation where applicable;
f. All engineering associated with structural and mounting details for support system where needed;
g. Integration of solar PV system with existing PV systems where applicable;

113. The LCEC reserves the right to add, modify, or delete criteria to or from this qualification list for any reason at its own discretion.

H. Technical Scoring

114. Only proposals that pass Stage 1 evaluation will be evaluated in the Technical Scoring-Stage 2.

115. The technical scoring is over 100.

116. Following this evaluation, each company will have one technical score (St). Companies that score 70 or higher will be selected to move to stage 3.

117. If the number of proposals that possess a score of 70 or higher is less than 3, then the top three proposals will be selected to move to stage 3 regardless of the scores.

118. The technical score of 100 will cover four (4) aspects:

Evaluation	Maximum Obtainable Points
a) Management and resource plan	35 points
b) Methodology	30 points
c) Products	20 points
d) Team composition and tasks assignment	15 points
Total	**100 points**

a) Management and Resource Plan

Ref.	Item	Max. Score	Criteria	Score
1	Formatting, Organization and Visual Clarity of the Submittal	4	Weak	0
			Fair	1
			Good	3
			Excellent	4
2	Year of Incorporation	5	Less than 1 year	0
			1 to 5 years	3
			5 to 10 years	4
			More than 10 years	5
3	Average Total Revenues of the Last Three years	6	Less than 100,000 USD	0
			100,001 to 300,000 USD	3
			300,001 to 500,000 USD	5
			More than 500,000 USD	6
4	Organizational and Management Approach for the Project	6	Weak	0
			Fair	1
			Good	3
			Excellent	5
			Outstanding	6
5	Previous Experience in the Solar PV Market in General (Capacity of Completed Projects Installations in kWp) **All PV systems with and without energy storage.*	4	301 to 500 kWp	0
			501 to 700 kWp	2
			701 to 900kWp	3
			More than 900 kWp	4
6	Previous Experience in the Solar PV with energy storage Market (Capacity of Completed Projects Installations in kWp) **Based on the Solar Photovoltaic Energy Experience form.*	6	201 to 300 kWp	0
			301 to 500 kWp	3
			501 to 800kWp	5
			More than 800 kWp	6
7	Previous Experience in the Lebanese Solar PV Market	4	Less than 1 year	0
			1 to 3 years	1
			3 to 5 years	2
			5 to 10 years	3
			More than 10 years	4
Maximum Obtainable Score		**35**		

b) Installation Methodology

Ref.	Item	Max. Score	Criteria	Score
1	Civil Structure Specifications and anti-rust measure	7	Not submitted	-6
			Incomplete	4
			Complete	7
2	Electrical interconnection measures with existing PV systems, and load segregation methodology where applicable	8	Not submitted	-5
			Incomplete	4
			Complete	8
3	Committed Installation Time	7	More than 30 days	0
			Between 20 and 30 days	5
			Less than 20 days	7
4	Overall Methodology of the installation of the remaining REEE measures (other than solar PV)	8	Weak	0
			Fair	2
			Good	4
			Excellent	6
			Outstanding	8
	Maximum Obtainable Score	**30**		

c) Products

Ref.	Item	Max. Score	Criteria	Score
1	Where applicable,selection of inverters as per the BoQs listed in Annex 3	6	Weak	0
			Fair	3
			Good	4
			Excellent	5
			Outstanding	6
2	Selection of other products as per the BoQs listed in Annex 3	6	Weak	0
			Fair	3
			Good	4
			Excellent	5
			Outstanding	6
3	Selection of the earthing system as per the BoQs listed in Annex 3	8	Weak	0
			Fair	3
			Good	5
			Excellent	7
			Outstanding	8
	Maximum Obtainable Score	**20**		

d) Team and Tasks

Ref.	Item	Max. Score	Criteria	Score
1	Team Leader- Total Years of Experience ** In case of multiple team leaders involved, the average years of experience will be considered* **Use Form 8: CV Of Team Leader*	3	5 to 10 years	1
			More than 10 years	2
			More than 15 years	3
2	Team Leader- Years of Experience in the Solar PV Industry ** In case of multiple team leaders involved, the average years of experience will be considered*	3	Less than 5 years	0
			5 to 7 years	1
			7 to 10 years	2
			More than 10 years	3
3	Technical and Managerial Staff Involved in the Project	3	Less than 4	0
			4 to 8	1
			8 to 10	2
			More than 10	3
4	Overall Evaluation of the CV's of Team Members **Use Form 9: CVs of Team Members*	3	Weak	0
			Fair	1
			Good	2
			Excellent	3
5	Distribution of Tasks Assignment	3	Weak	0
			Fair	1
			Good	2
			Excellent	3
	Maximum Obtainable Score	**15**		

119. The LCEC reserves the right to add, modify, or delete criteria to or from this qualification list for any reason at its own discretion.

120. The LCEC also reserves the right to change the weight associated to the different criteria for any reason at its own discretion.

I. General Terms and Conditions

121. Successful bidder will sign the contract agreement with the LCEC.

122. Proposal must be submitted as per the contents of this RFP using the forms shown in the forms section.

123. Cost of proposal: the bidder shall bear all costs associated with the preparation and submission of the proposal. The LCEC will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the RFP. All documents submitted in response to this RFP will become the property of LCEC. All prices shall be quoted in USD and including VAT.

124. The application, as well as all correspondence and documents relating to the RFP shall be written in the English language. Supporting documents and printed literature that are part of the application may be in another language, provided they are accompanied by an accurate official translation of the relevant passages into the English language, in which case, for purposes of interpretation of the application, the translation shall govern.

125. Confidentiality of Proposal: information relating to the evaluation of proposals shall not be disclosed to bidders or any other persons not officially concerned with such process until the notification of selection is made to all bidders.

126. Evaluators will read printed copy of proposal. All evaluators may not have access to the internet, therefore it is recommended to not include URLs, hyperlinks or other forms of internet-based content in the proposal.

127. Clarification of Proposal: to assist in the evaluation of proposal, LCEC may, at its discretion, ask any bidder for a clarification of its proposal which shall be submitted within a stated reasonable period of time. Any request for clarification and all clarifications shall be in writing and consequently no change in price or substance of the proposal shall be sought, offered or permitted. If a bidder does not provide

clarifications of the information requested by the date and time set in the request for clarification, its proposal may be rejected.

128. Proposal must offer services for the total requirements of the RFP. Proposals offering only part of the requirements will be rejected.

129. The bidder is expected to examine all corresponding instructions, forms, terms and specifications contained in the RFP. Failure to comply with these documents will be at the bidder's risk and may affect the evaluation of the proposal. Any proposal which is not responsive to the requirements of the RFP may be rejected.

130. Reservation of Rights: LCEC reserves the right to:
    a) Modify or withdraw from the RFP, or modify the provisions contained in the RFP, for any reason;
    b) Award contract to bidder(s) based on some or all criteria in this RFP, or additional criteria not specified in this RFP, or post-bid negotiations;
    c) Waive any material or immaterial non-conformity in any bid received
    d) Reject parts of bid or entire bid for any reason;
    e) LCEC shall have no obligation to provide a reason for rejecting a bid.

131. By submitting the proposal, bidder agrees that the terms in the proposal shall remain irrevocable for 180 days after the due date of the proposal.

132. At any time prior to the deadline for submission of proposals, LCEC may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the RFP by amendment. All prospective bidders that have received the RFP will be notified in writing of all amendments to the RFP.

133. In order to afford prospective bidders reasonable time in which to take the amendments into account in preparing their offers, LCEC may, at its discretion, extend the deadline for the submission of proposals.

134. Bid bond: the proposal shall be accompanied by a bid bond made payable in cash to the LCEC to the amount of 7,000 USD.

135. .The bid bond shall be drawn in a manner acceptable to the LCEC.

136. The bond shall be valid for 180 days starting from the tender opening date, and shall be automatically extended after this date. The LCEC may request an extension of the validation period of the tender.

137. If the winning bidder fails to sign the contract within thirty (30) days following the bid notification of the acceptance the full amount of the bid bond shall become automatically payable to the LCEC as a compensation of such default.

138. The bid bond will be returned without interest within thirty (30) days after one of the following events:
    a) If the proposal is rejected;
    b) If a proposal is successful; after signing the contract with the LCEC.
    c) If the bidding process is cancelled without awarding the contract.

139. The bidder shall indicate an appropriate price schedule for the services it proposes to supply under the contract.

140. The price of the current contract is a lump sum. The bidder's total remuneration shall be a fixed lump-sum including all staff costs, subcontractor's (if any) costs, printing, communications, travel, accommodation, and the like, and all other costs incurred by the bidder in carrying out the services. The contract price may only be increased if the parties have agreed to additional payments in case of modification of the terms and conditions of this contract.

141. LCEC shall effect payments to the winning bidder after acceptance by LCEC of the invoices submitted by the contractor, upon achievement of the corresponding milestones of the project defined as Deliverables. Payments will be effected in US Dollars. All terms will be detailed in the Contract to be signed between the winning bidder (s) and the LCEC.

142. The bidder may withdraw its proposal after the proposal's submission, provided that written notice of the withdrawal is received by LCEC prior to the deadline prescribed for submission of proposals. The bidder's withdrawal notice shall be prepared, sealed, marked, and sent by hand or fax but followed by a signed confirmation copy.

143. No proposal may be modified subsequent to the deadline for submission of proposals.

J. Miscellaneous Terms and Conditions

144. Corrupt and Fraudulent Practices: Anticorruption Policy requires bidders, suppliers, and contractors to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy the organization defines, for the purposes of this provision, the terms set forth below as follows:
    a) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;
    b) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
    c) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
    d) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.

145. LCEC will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive practices, or any illegal practice in competing for the Contract.

146. LCEC will sanction a party or its successor, including declaring ineligible, either indefinitely or for a stated period of time, to participate in contracts if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive practices, or any illegal practice in competing for, or in executing, a contract.

147. Conflict of Interest: LCEC considers a conflict of interest to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations, and that such conflict of interest may contribute to or constitute a

prohibited practice under LCEC's Anticorruption Policy. In pursuance of LCEC's Anticorruption Policy's requirement, bidders, suppliers, and contractors under contracts must observe the highest standard of ethics. LCEC will take appropriate actions to manage such conflicts of interest which may include rejecting a proposal for award if it determines that a conflict of interest has flawed the integrity of any procurement process. At the time of bidding, bidders may be considered to be in a conflict of interest with one or more parties if they, including but not limited to:

a) have controlling shareholders in common; or
b) receive or have received any direct or indirect subsidy from any of them; or
c) have the same legal representative for purposes of their Application; or
d) 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 to influence the bid of another Applicant in the subsequent bidding process or influence the decisions of LCEC regarding this prequalification process; or
e) participated as a consultant in the preparation of the technical specifications of the works that are the subject of this prequalification. Where a firm, or a firm from the same economic or financial group, in addition to consulting, also has the capability to manufacture or supply goods or to construct works, that firm, or a firm from the same economic or financial group, may not normally be a supplier of goods or works, if it provided consulting services for the contract corresponding to this prequalification, unless it can be demonstrated that there is no significant degree of common ownership, influence or control.

K. General Conditions of Contract

148. **LEGAL STATUS:** The Contractor shall be considered as having the legal status of an independent contractor vis-à-vis LCEC. The Contractor's personnel and sub-contractors shall not be considered in any respect as being the employees or agents of LCEC.

149. **SOURCE OF INSTRUCTIONS:** The Contractor shall neither seek nor accept instructions from any authority external to LCEC in connection with the performance of its services under this Contract. The Contractor shall refrain from any action which may adversely affect LCEC and shall fulfill its commitments with the fullest regard to the interests of LCEC.

150. **Contractor's RESPONSIBILITY FOR EMPLOYEES:** The Contractor shall be responsible for the professional and technical competence of its employees and will select, for work under this Contract, reliable individuals who will perform effectively in the implementation of this Contract, respect the local customs, and conform to a high standard of moral and ethical conduct.

151. **ASSIGNMENT:** The Contractor shall not assign, transfer, pledge or make other disposition of this Contract or any part thereof, or any of the Contractor's rights, claims or obligations under this Contract except with the prior written consent of LCEC.

152. **SUB-CONTRACTING:** In the event the Contractor requires the services of sub-contractors, the Contractor shall obtain the prior written approval and clearance of LCEC for all sub-contractors. The approval of LCEC of a sub-contractor shall not relieve the Contractor of any of its obligations under this Contract. The terms of any sub-contract shall be subject to and conform to the provisions of this Contract.

153. **OFFICIALS NOT TO BENEFIT:** The Contractor warrants that no official of LCEC has received or will be offered by the Contractor any direct or indirect benefit arising

from this Contract or the award thereof. The Contractor agrees that breach of this provision is a breach of an essential term of this Contract.

154. **INDEMNIFICATION:** The Contractor shall indemnify, hold and save harmless, and defend, at its own expense, LCEC, its officials, agents, servants and employees from and against all suits, claims, demands, and liability of any nature or kind, including their costs and expenses, arising out of acts or omissions of the Contractor, or the Contractor's employees, officers, agents or sub-contractors, in the performance of this Contract. This provision shall extend, inter alia, to claims and liability in the nature of workmen's compensation, products liability and liability arising out of the use of patented inventions or devices, copyrighted material or other intellectual property by the Contractor, its employees, officers, agents, servants or sub-contractors. The obligations under this Article do not lapse upon termination of this Contract.

155. **INSURANCE AND LIABILITIES TO THIRD PARTIES:**
    a) The Contractor shall provide and thereafter maintain insurance against all risks in respect of its property and any equipment used for the execution of this Contract.
    b) The Contractor shall provide and thereafter maintain all appropriate workmen's compensation insurance, or its equivalent, with respect to its employees or any third party member to cover claims for personal injury or death in connection with this Contract.
    c) The Contractor shall also provide and thereafter maintain liability insurance in an adequate amount to cover third party claims for death or bodily injury, or loss of or damage to property, arising from or in connection with the provision of services under this Contract or the operation of any vehicles, boats, airplanes or other equipment owned or leased by the Contractor or its agents, servants, employees or sub-contractors performing work or services in connection with this Contract.
    d) Except for the workmen's compensation insurance, the insurance policies under this Article shall:
        i. Name LCEC as additional insured;

ii. Include a waiver of subrogation of the Contractor's rights to the insurance carrier against LCEC;

iii. Provide that LCEC shall receive thirty (30) days written notice from the insurers prior to any cancellation or change of coverage.

e) The Contractor shall, upon request, provide LCEC with satisfactory evidence of the insurance required under this Article.

156. **ENCUMBRANCES/LIENS:** The Contractor shall not cause or permit any lien, attachment or other encumbrance by any person to be placed on file or to remain on file in any public office or on file with LCEC against any monies due or to become due for any work done or materials furnished under this Contract, or by reason of any other claim or demand against the Contractor.

157. **TITLE TO EQUIPMENT:** Title to any equipment and supplies that may be furnished by LCEC shall rest with LCEC and any such equipment shall be returned to LCEC at the conclusion of this Contract or when no longer needed by the Contractor. Such equipment, when returned to LCEC, shall be in the same condition as when delivered to the Contractor, subject to normal wear and tear. The Contractor shall be liable to compensate LCEC for equipment determined to be damaged or degraded beyond normal wear and tear.

158. **COPYRIGHT, PATENTS AND OTHER PROPRIETARY RIGHTS:** LCEC shall be entitled to all intellectual property and other proprietary rights including but not limited to patents, copyrights, and trademarks, with regard to products, or documents and other materials which bear a direct relation to or are produced or prepared or collected in consequence of or in the course of the execution of this Contract as well as after execution. At the LCEC request, the Contractor shall take all necessary steps, execute all necessary documents and generally assist in securing such proprietary rights and transferring them to LCEC in compliance with the requirements of the applicable law.

159. **USE OF NAME, EMBLEM OR OFFICIAL SEAL:** The Contractor shall not advertise or otherwise make public the fact that it is a Contractor with LCEC, nor shall the

Contractor, in any manner whatsoever use the name, emblem or official seal of LCEC, or any abbreviation of the name of LCEC in connection with its business or otherwise.

160. **CONFIDENTIAL NATURE OF DOCUMENTS AND INFORMATION:**

a) All maps, drawings, photographs, mosaics, plans, reports, recommendations, estimates, documents and all other data compiled by or received by the Contractor under this Contract shall be the property of LCEC, shall be treated as confidential and shall be delivered only to LCEC authorized officials on completion of work under this Contract.

b) The Contractor may not communicate at any time to any other person, Government or authority external to LCEC, any information known to it by reason of its association with LCEC which has not been made public except with the authorization of LCEC; nor shall the Contractor at any time use such information to private advantage. These obligations do not lapse upon termination of this Contract.

161. **FORCE MAJEURE; OTHER CHANGES IN CONDITIONS:**

a) Force majeure, as used in this Article, means acts of God, war (whether declared or not), invasion, revolution, insurrection, or other acts of a similar nature or force which are beyond the control of the Parties.

b) In the event of and as soon as possible after the occurrence of any cause constituting force majeure, the Contractor shall give notice and full particulars in writing to LCEC, of such occurrence or change if the Contractor is thereby rendered unable, wholly or in part, to perform its obligations and meet its responsibilities under this Contract. The Contractor shall also notify LCEC of any other changes in conditions or the occurrence of any event which interferes or threatens to interfere with its performance of this Contract. The notice shall include steps proposed by the Contractor to be taken including any reasonable alternative means for performance that is not prevented by force majeure. On receipt of the notice required under this Article, LCEC shall take such action as, in its sole discretion, it considers to be appropriate or necessary in the circumstances, including the granting to the Contractor of a reasonable extension of time in which to perform its obligations under this Contract.

c) If the Contractor is rendered permanently unable, wholly, or in part, by reason of force majeure to perform its obligations and meet its responsibilities under this Contract, LCEC shall have the right to suspend or terminate this Contract on the same terms and conditions as are provided for in Article 15, "Termination", except that the period of notice shall be seven (7) days instead of thirty (30) days.

162. **TERMINATION**

a) LCEC reserves the right to terminate without cause this Contract at any time upon 15 days prior written notice to the Contractor, in which case LCEC shall reimburse the Contractor for all reasonable costs incurred by the Contractor prior to receipt of the notice of termination.

b) In the event of any termination by LCEC under this Article, no payment shall be due from LCEC to the Contractor except for work and services satisfactorily performed in conformity with the express terms of this Contract. The Contractor shall take immediate steps to terminate the work and services in a prompt and orderly manner and to minimize losses and further expenditures.

c) Should the Contractor be adjudged bankrupt, or be liquidated or become insolvent, or should the Contractor make an assignment for the benefit of its creditors, or should a Receiver be appointed on account of the insolvency of the Contractor, LCEC may, without prejudice to any other right or remedy it may have, terminate this Contract forthwith. The Contractor shall immediately inform LCEC of the occurrence of any of the above events.

163. **SETTLEMENT OF DISPUTES:** The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to this Contract or the breach, termination or invalidity thereof. In case amicable efforts fail, the settlement of disputes will take place in the courts of Beirut according to Lebanese laws and regulations.

164. **CHILD LABOUR:** The Contractor represents and warrants that neither it, nor any of its suppliers is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia,

requires that a child 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. Any breach of this representation and warranty shall entitle the LCEC to terminate this Contract immediately upon notice to the Contractor, at no cost to the LCEC.

165. **OBSERVANCE OF THE LAW:** The Contractor shall comply with all Lebanese laws, decrees, ordinances, rules, and regulations (including future amendments) bearing upon the performance of its obligations under the terms of this Contract.

166. **AUTHORITY TO MODIFY:** No modification or change in this Contract, no waiver of any of its provisions or any additional contractual relationship of any kind with the Contractor shall be valid and enforceable against LCEC.

L. Forms

The Forms listed here can be found in a word format on the following link: https://www.lcec.org.lb/node/12909

Form 1 - Letter of Application

Date of Application **Day/Month/Year**

To: The Lebanese Center for Energy Conservation (LCEC)
Ministry of Energy and Water
Corniche du Fleuve, First Floor, Room 303
Beirut, Lebanon

From: [Insert company name]
[Insert full legal address]
[Insert full applicant's authorized representative name]
[Insert applicant's authorized representative telephone/Fax]
[Insert applicant's authorized representative mobile phone]
[Insert applicant's authorized representative email]

Name of the Project: "The Implementation of Renewable Energy & Energy Efficieny (REEE) Measures in Twenty One (21) Public Schools in Lebanon"

We, the undersigned, submit this proposal and declare that:

(a) We have examined and have no reservations to the most recent version of the RFP document and all its addendums;

(b) We hereby confirm that we will comply with the policy in regard to Corrupt and Fraudulent Practices, and we have no conflict of interest in accordance with the section mentioned on this issue in the RFP;

(c) We hereby confirm that if our proposal is selected, we shall sign the agreement as per the proposal;

(d) We plan to subcontract the following key activities and/or parts of the works:
[Insert any of the key activities, subcontractors, details of the sub-contractors, their qualification and experience]

(e) We understand that you may, without incurring any liability to the applicants, a) cancel the RFP at any time and b) accept no proposal or invite no applicant to sign the agreement. We also understand and accept that we shall bear all costs associated with its preparation and submission and that LCEC will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the selection process;

(f) All information, statements and description contained in the application are in all respect true, correct and complete to the best of our knowledge and belief;

(g) We understand that LCEC and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this application. This letter of application will also serve as an authorization to any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by LCEC to verify statements and information provided in this application, or with regards to the resources, experiences, and competence of the bidder.

[Insert full name of person signing the application]

In the capacity of: [Insert capacity of person signing the Application]

Duly authorized to sign the Application for and on behalf of: [Insert full name of Applicant]

Signature and Stamp

Form 2 – Applicant Information Form

Applicant's name:	[insert full name]
Applicant's actual country of registration:	Lebanon
Applicant's actual year of incorporation:	[indicate year of Constitution]
Applicant's legal address in Lebanon:	[insert street/ number/ town or city/ Lebanon]
Applicant's authorized representative information Name: Address: Telephone/Fax numbers: E-mail address:	[insert full name] [insert street/ number/town or city/country] [insert telephone/fax numbers, including country and city codes] [indicate e-mail address]

Attach copies of original documents of articles of incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above.

Form 3 – Solar Photovoltaic Energy Experience

[Name of Applicant]

- *Please only list the requested relevant experience in Lebanon*
- *Please list the most recent projects (starting from 2023 and 2022)*
- *Please only list the projects that were completed and commissioned*
- *Assignments completed by the bidder's individual experts working privately or through other firms, partners, or sub-contractors cannot be claimed as the relevant experience of the bidder*

1. Please list a minimum installed cumulative capacity of solar PV projects equivalent to 200 kWp with energy storage

Project Ref.	Project Size (kWp and kWh storage)	Storage Type (Lead Acid/Lithium)	Project Location	Completion Date	Client Contact Details
1					
2					
3					
4					
5					
6					
[add rows as necessary]					

2. Please provide five (5) pictures from your solar with battery storage implementations, showing the metallic structure, PV array, batteries, inverters, cable routing, etc.
   Please insert in the caption the size (kWp and kWh storage) and location of the system.

Picture 1	
Caption	
Picture 2	
Caption	
Picture 3	
Caption	
Picture 4	
Caption	
Picture 5	
Caption	

Form 4 - Bid Bond

The Bid Bond submitted by the Bidder shall be in conformance with the below sample form. Any alternate form/text would result in the rejection of the Bid.

To:	The Lebanese Center for Energy Conservation (LCEC) Ministry of Energy and Water Corniche du Fleuve, First Floor, Room 303 Beirut, Lebanon
Name of the Project:	"The Implementation of Renewable Energy & Energy Efficieny (REEE) Measures in Twenty One (21) Public Schools in Lebanon")

By this guarantee we confirm that we, the undersigned, are bound unto LCEC in the sum of 7,000 USD (hereinafter called "Bid Deposit") for which a cash deposit has been well and truly made to LCEC.

The conditions of the obligation under this Bid Bond are:

1. If the Bidder withdraws the Bid during the period of bid validity specified in the project RFP; or
2. If the Bidder having been notified of the acceptance of its Bid by LCEC during the period of Bid validity:
   - Fails or refuses to execute the Contract,

   or
   - Refuses to accept the correction of the errors in the Bid.

The Bidder hereby constitutes and appoints LCEC as its attorney to assign, appropriate, transfer and apply the said Bid Deposit as a result of the occurrence of one or both of the two conditions, without notice.

This Bid Bond will remain in force up to and including the date 180 days after the deadline for submission of Bids and it may be extended automatically after this date, notice of which extension(s) is hereby waived.

The conditions under which the obligation under this Bid Bond will be null and void and the Bid Deposit will be released and returned to the Bidder are:

- If the Bidder is notified of the rejection of its Bid by LCEC,
  or
- If the Bidder having been notified of the acceptance of its Bid by LCEC executes the Contract.

[Insert full name of person signing the application]

In the capacity of: [Insert capacity of person signing the Application]

Duly authorized to sign the Application for and on behalf of: [Insert full name of Applicant]

[Insert full legal address]
[Insert applicant's authorized representative telephone/Fax]
[Insert applicant's authorized representative mobile phone]
[Insert applicant's authorized representative email]

Signature and Stamp

Form 5 - Financial Situation and Performance

[Name of Applicant]

- *The Applicant shall complete the below table.*
- *The Applicant shall provide copies of financial statements for 2020, 2021, and 2022. The financial statements shall: (a) reflect the financial situation of the Applicant, (b) be independently audited or certified in accordance with local legislation, (c) be complete, including all notes to the financial statements, (d) correspond to accounting periods already completed and audited*

Type of Financial information in (USD)	Historic information for (USD)		
	2022	2021	2020
Statement of Financial Position (Information from Balance Sheet)			
Total Assets (TA)			
Total Liabilities (TL)			
Total Equity/Net Worth (NW)			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital (WC)			
Information from Income Statement			
Total Revenue (TR)			
Profits Before Taxes (PBT)			
Cash Flow Information			
Cash Flow from Operating Activities			

Form 6 – Team Compostition and Tasks Assignment

[Name of Applicant]

Please attach the CV of each team member separately.

Team Member Name	Position in this Project	Assigned Tasks	Experience in the design, supply, and installation of solar PV with storage systems	Number of operational solar with storage projects

Form 7 - Cash Retention

- *At the bid submission stage, this form has only to be signed and stamped, no need to be completed.*
- *Once the contract is awarded, the contractor will complete the form and submit it, prior to the contract signature.*

To:	The Lebanese Center for Energy Conservation (LCEC) Ministry of Energy and Water Corniche du Fleuve, First Floor, Room 303 Beirut, Lebanon
Name of the Project:	"The Implementation of Renewable Energy & Energy Efficieny (REEE) Measures in Twenty One (21) Public Schools in Lebanon")

WHEREAS, [Applicant's Name], duly represented by [Insert full name of person signing the application] [Insert full legal address], hereinafter called "the Contractor" has undertaken in pursuance of the Contract dated [Date of contract signature] between the Contractor to execute the Implementation of Renewable Energy & Energy Efficieny (REEE) Measures in Twenty One (21) Public Schools in Lebanon, hereinafter called "the Contract" for the Lebanese Center for Energy Conservation having its address at the Ministry of Energy and Water Building, Corniche du Fleuve, 1st Floor, Room 303, Beirut, Lebanon hereinafter called "the LCEC";

AND WHEREAS it has been stipulated in the said Contract that the Contractor shall be responsible of a one (1) year of O&M following the issuance of the Provisional Acceptance Certificate by the LCEC;

NOW THEREFORE the Contractor hereby affirms that LCEC will be withholding a total of [10% of the Contract Value in USD. from its first payment to the Contractor, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, hereinafter called "the Cash Retention", and LCEC shall have recourse to the Cash Retention without cavil or argument, within the limits of [10% of the Contract Value in USD] as aforesaid without needing to prove or to show grounds or reasons for such recourse for the sum specified therein.

The Contractor hereby waives the necessity of LCEC demanding the said debt from the Contractor before having recourse to the Cash Retention.

The Contractor and LCEC, herehinafter jointly called "the Parties", further agree that no change or addition to or other modification of the terms of the Contract or of the works to be performed hereunder or of any of the Contract documents which may be made between the Parties shall in any way release any Party from any liability under this guarantee.

This guarantee shall be valid for one (1) year from the date of issuance of the Provisional Acceptance Certifiacte by LCEC.

[Insert full name of person signing the application]

In the capacity of: [Insert capacity of person signing the Application]

Duly authorized to sign the Application for and on behalf of: [Insert full name of Applicant]

[Insert full legal address]
[Insert applicant's authorized representative telephone/Fax]
[Insert applicant's authorized representative mobile phone]
[Insert applicant's authorized representative email]

Signature and Fiscal Stamp

Form 8 - CV of Team Leader

[Use this standard format for specifying the name of the team leader. The CV of the team leader must be attached separately.]

Solar Photovoltaic Plant Development	
Person name:	
Title in the project:	
Affiliation:	
Experience	
Date range:	
Project name:	
Role:	
Date range:	
Project name:	
Role:	
Date range:	
Project name:	
Role:	

[Add tables as needed]

Form 9 - CVs of Team Members

[Use this standard format for specifying names of key people that constitute the team. CV's of the team members must be attached separately.]

[If the bidder intends to subcontract any of the key activities, then the subcontractor name shall be clearly identified in the Affiliation, and attach a letter of support from the subcontractor stating the name of the project and personnel provided. Add more rows if necessary.]

Solar Photovoltaic Plant Development	
Person name:	
Title in the project:	
Affiliation:	
Experience	
Date range:	
Project name:	
Role:	
Date range:	
Project name:	
Role:	
Date range:	
Project name:	
Role:	

[Add tables as needed]

Form 10 - Performance Guarantee Letter

[Name of Applicant]

I the undersigned [Insert full name of person signing the application] in my capacity of [Insert capacity of person signing the Application] dully authorized to sign for and on behalf of [Insert full name of Applicant] hereby confirm that, within the "the Implementation of Renewable Energy & Energy Efficiency (REEE) Measures in Twenty One (21) Public Schools in Lebanon" in co-operation with the LCEC, we guarantee the **good and safe operation** of all implemented REEE measures, excluding any event related to the failure of the equipment procured by the project, and not caused by the improper installation or configuration by [Insert full name of Applicant].

The acceptance test will be successful if the following tests related to all of the REEE measures were successfully completed:

- Normal operation of the PV system with energy storage as per the T&C tests in Annex 4.
- Normal operation of the configured indoor air quality sensors.
- Normal operation of the configured weather stations, where applicable.
- Normal operation of the installed LED lights, where applicable.
- Normal operation of the installed solar drive inverters, where applicable.

The performance tests consist of having a normal operation of the following implemented measures for two (2) consecutive weeks:

- PV system with energy storage
- Weather stations
- Solar drive inverters

Form 11 - Warranty Form

[Name of Applicant] *Please specify the full warranty period on each component, starting from the issuing of the Provisional Acceptance Certificate.*

Component	Full Warranty Period (Years)
Mounting Structure	[At least 10 years staring from the issuing of the Provisional Acceptance Certificate]
DC Protection Box and Components	[At least 2 years starting from the issuing of the Provisional Acceptance Certificate]
Inverters (where applicable as per Annex 3)	[At least 5 years starting from the issuing of the Provisional Acceptance Certificate]
AC Protection Box and Components	[At least 2 years starting from the issuing of the Provisional Acceptance Certificate]
Remote Monitoring Equipement, Data Acquisition Software, and Remote Monitoring where applicable	[At least 3 years starting from the issuing of the Provisional Acceptance Certificate]

[Insert full name of person signing the application]

Signature and Fiscal Stamp

M. Annexes

Annex 1: Schools Lots Distribution & Site Visits Schedule

- Lot 1: Bekaa Governorate
- Lot 2: Beirut & Mount Lebanon Governorates
- Lot 3: North Governorate
- Lot 4: South Governorate

Table 2: Lot 1 Schools Information

Lot 1: Bekaa Governorate			
School #	**School Name (School Code)**	**School District**	**School Coordinates**
1	Bar Elias Elementary Public School (BE832) بر الياس الرسمية الابتدائية	Zahle زحلة	33.7784230, 35.9017060
2	El Qaa intermediate Public School (QA889) متوسطة القاع الرسمية	Baalbak بعلبك	34.3471200, 36.4710790
3	Joub Jannine secondary Public School (JJ985) ثانوية جب جنين الرسمية	West Bekaa البقاع الغربي	33.6282900, 35.7983100
4	Al Nabi Sheet Intermediate Public School (NS956) متوسطة النبي شيت الرسمية	Baalbak بعلبك	33.8706270, 36.1084380

Table 3: Lot 2 Schools Information

Lot 2: Beirut & Mount Lebanon Governorates			
School #	**School Name (School Code)**	**School District**	**School Coordinates**
5	For Girls Second Public School (GS17) البنات الثانية الرسمية	Beirut بيروت	33.885316492965856, 35.49722345541198
6	Rene Mouawad Secondary Public School (56-57) ثانوية الرئيس رينيه معوض الرسمية	Beirut بيروت	33.89178441620763, 35.487271311234224
7	Hasan Saab Mixed Secondary Public School (56-57) ثانوية الدكتور حسن صعب الرسمية المختلطه	Beirut بيروت	
8	Ghaboun mixed intermediate (Ghaboun260) الغابون المختلطة الرسمية	Aley عاليه	33.777752, 35.593128
9	Baaklin Mixed Intermediate Public School (BA311) بعقلين المتوسطة الرسمية المختلطة	Chouf الشوف	33.6797510, 35.5785910
10	Yahshouh Mixed Intermediate Public School (YA216) يحشوش المتوسطة الرسمية المختلطة	Ftouh Keserouan فتوح كسروان	34.0694000, 35.7402530
11	Bteghreen Mixed Intermediate Public School (BT222-223) بتغرين الرسمية المتوسطةالمختلطة	Northern Metn المتن الشمالي	33.929392, 35.746536
12	Bteghreen Secondary Public School (BT222-223) ثانوية بتغرين الرسمية المختلطة	Northern Metn المتن الشمالي	

Table 4: Lot 3 Schools Information

Lot 3: North Governorate			
School #	**School Name (School Code)**	**School District**	**School Coordinates**
13	AlJdeideh Intermediate Public School for Boys (363-375) الجديدة الرسمية للصبيان	Tripoli طرابلس	34.4386940, 35.8404690
14	Farah Antoun Public School For Boys (363-375) فرح انطون الرسمية للبنين	Tripoli طرابلس	
15	Menyarah public school for Girls (MN542) منيارة الرسمية للبنات	Akkar عكار	34.533191, 36.064132
16	Zgharta Secondary Public School (ZG674) ثانوية زغرتا الرسمية	Zgharta زغرتا	34.399632, 35.895721
17	Kfaraakka First Mixed Public School (KF725) مدرسة كفرعقا الاولى المختلطة الرسمية	Koura الكورة	34.305015, 35.8360170

Table 5: Lot 4 Schools Information

Lot 4: South Governorate			
School #	**School Name (School Code)**	**School District**	**School Coordinates**
18	Deir Qanoun Ras Al Ain Intermediate Public School (DQ1276) دير قانون راس العين المتوسطة الرسمية	Tyr صور	33.2223600, 35.2499060
19	Kafra Elementary Public School (KA1312) كفرا الابتدائية الرسمية	Bint Jbeil بنت جبيل	33.1727830, 35.3353150
20	Matariet El Choumar Intermediate Public School (MC1369) متوسطة مطرية الشومر الرسمية	Saida صيدا	33.3389670, 35.2856490
21	Zebdine Intermediate Public School (ZE1371) متوسطة زبدين الرسمية	Nabatiye النبطية	33.3760320, 35.4587560

Site visits schedule:

- The below tables show the schedule for the site visits to the twenty one (21) schools located in eighteen (18) different buildings, as three pairs of schools are located in the same building.
- Each bidder may apply for a maximum of two (2) lots out of four (4).
- As per the schedules, each day, every interested bidder shall have two teams diffused in the corresponding lot where two teams from the LCEC will be conducting the site visits.

Table 6: Lot 1 Visits Schedule

Lot 1: Bekaa Governorate			
School #	**School Name**	**Date**	**Time**
1	Bar Elias Elementary Public School بر الياس الرسمية الابتدائية	May 23, 2023 – Team 1	9:00 AM
2	El Qaa intermediate Public School متوسطة القاع الرسمية	May 23, 2023 – Team 2	13:30 PM
3	Joub Jannine secondary Public School ثانوية جب جنين الرسمية	May 23,2023 – Team 1	12:00 PM
4	Al Nabi Sheet Intermediate Public School متوسطة النبي شيت الرسمية	May 23,2023 – Team 2	10:00 AM

Table 7: Lot 2 Visits Schedule

Lot 2: Beirut & Mount Lebanon Governorates			
School #	**School Name**	**Date**	**Time**
5	For Girls Second Public School البنات الثانية الرسمية	May 24, 2023 – Team 1	8:30 AM
6	Rene Mouawad Secondary Public School ثانوية الرئيس رينيه معوض الرسمية	May 24, 2023 – Team 1	11:00 AM
7	Hasan Saab Mixed Secondary Public School ثانوية الدكتور حسن صعب الرسمية المختلطه		
8	Ghaboun mixed intermediate الغابون المختلطة الرسمية	May 24,2023 – Team 2	15:00 PM
9	Baaklin Mixed Intermediate Public School بعقلين المتوسطة الرسمية المختلطة	May 24,2023 – Team 1	14:30 PM
10	Yahshouh Mixed Intermediate Public School يحشوش المتوسطة الرسمية المختلطة	May 24,2023 – Team 2	9:00 AM
11	Bteghreen Mixed Intermediate Public School بتغرين الرسمية المتوسطةالمختلطة	May 24,2023 – Team 2	12:00 PM
12	Bteghreen Secondary Public School ثانوية بتغرين الرسمية المختلطة		

Table 8: Lot 3 Visits Schedule

Lot 3: North Governorate			
School #	**School Name**	**Date**	**Time**
13	AlJdeideh Intermediate Public School for Boys الجديدة الرسمية للصبيان	May 26,2023 – Team 1	10:00 AM
14	Farah Antoun Public School For Boys فرح انطون الرسمية للبنين		
15	Menyarah public school for Girls منيارة الرسمية للبنات	May 26,2023 – Team 1	13:30 PM
16	Zgharta Secondary Public School ثانوية زغرتا الرسمية	May 26,2023 – Team 2	12:30 PM
17	Kfaraakka First Mixed Public School مدرسة كفرعقا الاولى المختلطة الرسمية	May 26,2023 – Team 2	10:00 AM

Table 9: Lot 4 Visits Schedule

Lot 4: South Governorate			
School #	**School Name**	**Date**	**Time**
18	Deir Qanoun Ras Al Ain Intermediate Public School دير قانون راس العين المتوسطة الرسمية	May 29,2023 – Team 1	10:00 AM
19	Kafra Elementary Public School كفرا الابتدائية الرسمية	May 29,2023 – Team 1	12:30 PM
20	Matariet El Choumar Intermediate Public School متوسطة مطرية الشومر الرسمية	May 29,2023 – Team 2	9:30 AM
21	Zebdine Intermediate Public School متوسطة زبدين الرسمية	May 29,2023 – Team 2	12:30 PM

Annex 2: Technical Design & Drawings

The Technical Design and Drawings referred to as Annex 2 can be found on this link:

https://www.lcec.org.lb/node/12909

Annex 3: Bills of Quantities (BoQs)

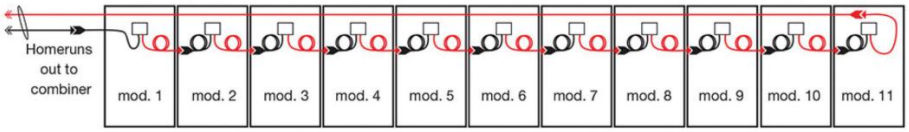
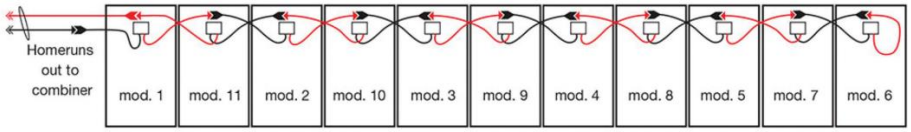
The Bills of Quantities referred to as Annex 3 can be found on this link:

https://www.lcec.org.lb/node/12909

Annex 4: Technical Specifications, T&C, and O&M information

Where applicable, the below technical specifications, tests, and O&M measures should be applied by the contractors.

Mounting Structure	
Type	Fixed-tilt type
Fixation	▪ Direct fixation into the roof is not allowed ▪ Any direct or indirect impact on the roof waterproffing, should be remediated
Material	▪ Either hot-dip galvanized steel or aluminum ▪ The cutting edges and openings should be cold galvanized ▪ Nuts and bolts shall be stainless steel of grade SS 304
Minimum Warranty	10 years
DC Cables for PV Array	
General Specifications	▪ Solar DC cables, copper conductor, halogen-free, double insulated, UV protected and fireproof, with IP67 MC4 connectors ▪ DC cables between the modules and the inverters section has to be sized to limit the total voltage drop in the DC circuit to a value less than 4% of its value at rated power
Routing	▪ All DC wiring shall be installed so that it is mechanically and electrically sound and neat in appearance ▪ DC cables shall be routed from the PV array to the junction boxes, DC protection boxes, or inverters in covered UV resistant cable trays ▪ The cable trays shall be hot-dip galvanized and shall be equipped with all the needed brackets, clips, junctions, and accessories for installation and fixation ▪ Electric Metallic Tubing (EMT) conduits and cables glands shall also be used where advised by LCEC

	▪ The outside corrosion protection of EMT conduits shall be zinc-based and the inside shall have an organic corrosion-resistant coating ▪ The cutting edges and openings of cable trays and cable conduits should be cold galvanized ▪ Induction loops must be avoided when cabling strings; it is highly recommended to use the skip-wiring method (also known as leap-frog) instead of the conventional daisy-chain method, as per the figure below *(Source: UNDP DREG Best-Practices Guidelines and Lessons Learnt for On-grid and PV-diesel Hybrid Systems Guideline Report)*  Figure 1a – Conventional daisy-chain wiring (Source: solarprofessional.com)  Figure 1b – Proposed skip-wiring method (Source: solarprofessional.com)
DC Protection Box	▪ The contractor is responsible for the supply and installation of a thermoplastic box for general DC load break of a PV array connected to a single inverter or charge controller input, with the following requirements: ▪ Class II ▪ IP54 for indoor use and IP65 for outdoor use ▪ The DC protection box shall be equipped with appropriate safety, functionality, grounding and protection
Labeling	▪ Each string of panels has to be properly labeled with the reference and corresponding polarity, every ten (10) meters and at the input and output of cables trays, junction boxes, DC protection boxes, protection devices, or inverters ▪ Each component installed within the DC protection box shall be labeled

	▪ The DC protection box shall include the label "Warning: DC Energized Cables"
Standards	Compliance with the following standards, or equivalent: ▪ Compliance of DC cables with IEC 62930:2017 and EN 50618:2014 ▪ Compliance of DC protection box with IEC 60529 and IEC 62208 ▪ Compliance of circuit breakers with IEC 60947 (Part 1, 2, and 3)
Minimum Warranty	2 year-warranty on DC protection box and components
Inverter (s)	
Grid Type	▪ Single or Three phase
Topology	Transformerless
Coupling	DC coupled, with the ability to inject the excess of energy into EDL grid
Nominal Output Frequency	▪ 50 Hz +/-0.1% ▪ For on-grid operation, the frequency shall be adjusted to operate as per EDL grid requirements
Output Voltage	3L/N/PE, 220/380 Vac, 230/400 Vac
Power Factor	Adjustable from 0.8 leading to 0.8 lagging
Maximum Efficiency	At least 97%
Number of MPPT	At least 2
Maximum Total Harmonic Distortion	Less than 3%
Protection Required	▪ The three-phase inverter should be able to realize 100% unbalanced phase-level output ▪ Anti-Islanding Protection (Integrated) ▪ DC Reverse Polarity Protection (Integrated)
Protection Degree	At least IP65 if placed outdoor At least IP 54 if placed indoor
Labeling	Each inverter shall be labeled with a sticker showing its reference number

Standards	Compliance with the following standards, or equivalent: ▪ NL EN 62116:2016 ▪ NL EN 61427-2:2017 ▪ NL EN 61427-1:2017 (if off-grid inverter) ▪ IEC 61000-3 or equivalent (parts 2,3,4,5,11 and/or 12 to be specified) ▪ IEC 62109-1 ▪ IEC 62109-2
Minimum Warranty	5 years
AC Cables	
General Specifications	▪ Multipolar cables with double insulation (Class II) ▪ AC cables between the inverters and connection have to be sized to limit the total voltage drop in the AC circuit to a value less than 3% of its value at rated power
Routing	▪ All AC wiring should be installed so that it is mechanically and electrically sound and neat in appearance ▪ AC cables shall be routed in covered UV resistant cable trays ▪ The cable trays shall be hot-dip galvanized and shall be equipped with all the needed brackets, clips, junctions, and accessories for installation and fixation ▪ EMT or PVC conduits and cables glands shall also be used where advised by the client ▪ The cutting edges and openings of cable trays and EMT cable conduits should be cold galvanized
AC Protection Box	▪ The contractor is responsible for the supply and installation of a thermoplastic box for general AC protection box with the following requirements ▪ Class II ▪ IP54 for indoor use and IP65 for outdoor use ▪ The AC protection box shall be equipped with appropriate safety, functionality, grounding and protection
Labeling	▪ AC cables shall be labeled with "AC solar power" cables every ten (10) meters and at the input and output of cables trays,

	junction boxes, AC protection boxes, protection devices, or inverters ▪ Each component installed within the AC protection box shall be labeled ▪ The AC protection box shall include the label "Main Switchboard"
Standards	Compliance with the following standards, or equivalent: ▪ Compliance of AC cables with IEC 60228, IEC 60332-1-2 and IEC 60502-1 ▪ Compliance of AC protection box with IEC 60529 and IEC 62208 ▪ Compliance of circuit breakers with IEC 60947 (Part 1, 2, and 3) ▪ Compliance of SPD with IEC 61643-11 ▪ Compliance of RCD with NL IEC 60364-4-41:2003
Minimum Warranty	2 year-warranty on AC protection box and components
Remote Monitoring	
Data Readings	▪ A data monitoring system shall be accessible locally and also remotely via the web ▪ The monitoring interface shall provide at least the following readings: - On site measured irradiation data - DC and AC power - DC and AC voltage - DC and AC current - Energy production (kWh) - Battery state of charge - Load flow to and from battery (charged or discharged) - Faults and alarms ▪ The contractor is responsible for the supply of all the needed components to connect the monitoring system to the internet available in the facility ▪ A data access for remote monitoring shall be provided to the owner

	▪ At least 2 months of local logging and storage of historical data must be available at 10-minute intervals ▪ The operators shall have a free remote access to all the requested data, throughout the lifetime of the project (at least 20 years) ▪ No license purchase or renewal shall apply throughout the lifetime of the project (at least 20 years)
Communication	WIFI/LAN/RS485
Minimum Warranty	3 years on equipment, data acquisition software, and remote monitoring
Safety Signage	
▪ Suitable signs to warn of electrical hazards associated with the presence of photovoltaic plants should be installed where necessary ▪ The material shall be anti-corrosive and durable	
Labeling	
Please check the labeling requirements in each section	
Earthing	
▪ The contractor is responsible for the installation of an electrical earthing system in each site in the form of eathing rods, with a ground resistance value less than 5 ohms. ▪ The rods may be copper or copper-clad steel, one or two meters long. ▪ The distance between rods should be two or three times depth. ▪ The contractor is responsible for the interconnection of all the metallic parts of the plant, including but not limited to metallic structure, cable trays, panelboards, inverters, relevant protection devices, etc. on both DC and AC sides. The bonding connection must be connected to the main earthing terminal. ▪ The earthing and bonding cables have to be yellow-green colored. ▪ The earthing system shall be compliant with IEC 60364-7-712 - Low voltage electrical installations - Part 7-712: Requirements for special installations or location	
Lightning	
▪ The contractor is repsonsible for the supply and installation of a complete external lightning protection system (LPS) in each site.	

- The contractor must keep a certain separation distance between the conductive parts of the solar PV system and the LPS, to prevent shadows, induced overvoltage, and arcing.
- If separation distance cannot be maintained, the metal components of the solar PV system must be connected to the LPS through a conductor with a cross-section of at least 16mm^2.
- The Lightning protection system should be implemented according to IEC 62305-3 and best practices for similar systems.
- The ground rods of the earthing system and lighting protection system should not be bonded.

Safety Requirements

- The solar PV systems with battery storage shall be designed considering the safety during the construction and operation especially:
  - Safety of workers
  - Safety of users
  - Safety for the equipment of the plant
  - Safety for existing infrastructures and systems
- Any intervention on the inverters must be possible in full electrical safety.
- The contractor is responsible for the supply, installation, and tesing of the following components in the inverters/battery bank room:
  - One (1) portable powder fire extinguisher in each site
  - One (1) standalone smoke detector with alarm in each site
  - One (1) standalone Hydrogen Fluoride sensor with alarm in each site

Operation and Maintenance

- The contractor is responsible for the supply and installation of the following components:
  - One (1) weatherproof electrical socket for maintenance purposes in each site
  - One (1) water access point next to the PV array in each site, for cleaning activities
- The contractor shall be responsible of the O&M of systems for a period of one (1) year, following the issuing of the provisional acceptance certificate by LCEC and the successful commissioning of the systems.
- The contractor shall furnish all necessary staff, supplies, materials, and equipment needed for the O&M activities.
- The O&M activities will include:

	- Daily remote monitoring of systems performance, alarms and disgnostics - Preventive maintenance - Corrective maintenance to take the necesssary remedial measures or exchange the failed components procured by the contractor or failed due to improper installation by the contractor - Updates of documentation where applicable - Reporting to LCEC when requested ▪ The preventinve maintenance shall be conducted twice per year with the presence of LCEC representatives, to inspect and maintain the PV array and mounting structures, the inverters/chargers, the batteries, the weather station, the remote monitoring, the wiring systems and enclosures, the connectors, the protection devices, the metallic parts, the eathing and lightning systems, in addition to the labels and signage. - During the preventive maintenance, the contractor shall check any visual defects, discolouration, corrosion, deterioration, or mechanical damage of the components and take the suitable remedial measures in coordination with LCEC. - The contractor shall make sure that there are no loose or missing panels clamps - The contractor shall make sure that the enclosures show no signs of internal heating and that the fuses, holders and protection devices are still intact. - The contractor shall make sure that the labels and signage are still visible, legible, and adequtely labelled. ▪ Any proposed remedial solution has to be approved by LCEC, prior to taking any action on site. ▪ The contractor shall respond to field failures within 3 days from LCEC approval.
Testing and Commissioning	
	▪ The contractor is responsible for obtaining the necessary tools and conducting the testing and commissioning of the solar PV systems with battery storage, including but not limited to the below tests. ▪ If the results of the tests are not compliant with the requirements of the RFP, the contractor is responsible for taking the necessary remedial measures in coordination with LCEC.
Final Checkouts and Visual Inspection	▪ The site is clean and orderly ▪ The installation matches the design documentation

	▪ The modules and cable routing is done properly ▪ The equipment is securely mounted ▪ Cut metallic edges and openings are cold galvanized ▪ The installations are matched to the manufacturer's specifications and recommendations ▪ Warning signs and labels are posted appropriately ▪ Safety equipment is installed properly ▪ The installations are compliant with standards and best practices
Mechanical Systems and Civil Works	▪ Make sure that there is no rust or cracks formed in the mounting structure or foundation ▪ Make sure that all clamps, nuts, and bolts are secured and tightened as per the manufacturer's recommendations, using a torque meter ▪ Inclination test of panels using inclinometer, shall result in a consistent tilt angle of panels as per the design ▪ Orientation test of panels using compass, shall result in a consistent orientation angle of panels as per the design
Electrical Systems	▪ DC voltage test and comparison with expected voltage ▪ Polarity test ▪ Open circuit test ▪ Short circuit test ▪ Insulation resistance test ▪ Ground resistance test (date to be specified by LCEC) ▪ Voltage drop tests
Functional Tests	▪ Start-up procedure ▪ Verify the proper operation of components' connection and disconnection sequences ▪ Verify that the inverters and AC modules de-energize their output to utility grid upon loss of grid voltage ▪ Verify that inverters automatically reconnect to their output to the grid once the voltage has been restored

	▪ Charging of batteries from the PV system only, supply of loads from the PV system only, supply of loads from the batteries only. ▪ Power export to EDL. ▪ Normal operation of the PV system with the existing PV systems, and the load segregation configuration, where applicable. ▪ Verify the proper grid voltage and frequency to operate inverters ▪ Verify that the data communication is working properly ▪ Conduct a communication equipment functional test ▪ Check validity of all data recording and readings including export, download and data transfer ▪ Parallel operation with existing power sources
Documentation and Training	
O&M Manual	▪ Two (2) printed copies of the O&M manual shall be delivered to the client ▪ The O&M manual shall provide an overview of the project and shall include considerations for operation in the presence of faults including but not limited to: A. Contact Details of Contractor and Suppliers of Main Equipment **B. Remote Monitoring System Usage and Control** - Dashboard details and functionality - Alarms systems levels and categories - Generate reports and analyze the data received **C. Monitoring Equipment Maintenance and Data Collection System** - Explain the dashboard and interface - How to read data - How to retrieve data - How to save as .csv file **D. Panel Cleaning and Panel Replacement** - Cleaning method and tools used - Importance of cleaning and soiling effect on the performance of the system

	- Handling method of the replacement **E. Inverter Functionality, Resets, and Interface** - Explain interface and advantages - Explain alarms and categories - Procedure for alarms categories - Explain the string monitoring system - Explain the security components and importance of each component **F. Shop Drawings and As built Drawings, Stringing Summary, Datasheets, Inventory List, etc.**
Training of Operators	A training of operators shall be conducted by the contractor at the end of the project, introducing the systems and explaining the different parts of the O&M manual in a power point presentation.

Annex 5: Safety Measures for Transportation & Installation of Goods

- **All safety measures, including but not limited to the below mentioned measure, shall be followed during all stages of transportation of goods from the LCEC's warehouse located in Roumieh, to each of the 21 schools.**

- **The safety measures shall then be applied during the loading, transportation, unloading, and installation of energy items.**

- **The winning bidders shall ensure the availability of a valid transport and logistics insurance to avoid any unexpected risks.**

I) Safety:

1. **General:**
   All workers handling, transporting, or measuring the batteries must wear the required **P**ersonal **S**afety **E**quipment **(PSE)** and must be aware potential risks for:
   - Electrostatic Discharge (ESD)
   - Danger of electrical shock (short circuit of batteries cells)
   - Danger of transport damage, batteries falling.
2. **Personal Safety Equipment (PSE):**
   - Antistatic safety shoes
   - Antistatic 100% cotton clothes
   - Antistatic gloves
   - Safety Glasses
   - Face shields
   - First aid Kit should be always available.
3. **Safety introduction:**
   - Person "In Charge" must be assigned
   - Person in charge must do a proper safety introduction underlining safety issues, introduce the scheduled work procedure and assign duties and responsibilities.
   - Read and explain the most important safety issues from the Battery Manufacturers Manual and other relevant safety issues

- Check and assure that all transportation equipment (Fork lifter, sack barrow, transport belts, etc. are in good and safe condition)

4. **Wooden Pallets with 8 Battery cells each:**
   - Take necessary measures to safely transport batteries held on pallets that are not in a good condition.
5. **Battery Cells:**
   - Check that cells on each pallet are tightly "wrapped", either with original packing belts or with transport belts.
   - Check that carton paper is placed between the individual cells.

6. **Cell poles:**
   - Check that cell interconnections are uninstalled and that pole isolator caps are set.

II) Installation:

1. **Battery Room:**
   - Assure the room is clean, sufficiently ventilated, ambient temperature is within range.
   - Assure Hydrogen Fluoride detector and fire extinguisher are installed in the room.

2. **Battery Rack:**
   - Assure battery rack is properly installed and all screws connectors are positioned right and tight.
   - Grounding of the rack as per the Lebanese Norms and Standards
3. **Placing Battery Cells on the rack:**
   - Assure right distance between cells and smooth moving on the rack.
   - Use grease on batteries poles as per the manufacturer's manual.
4. **Cell Interconnection:**
   - Clean cells cover with slightly wet cotton as per the manufacturer's manual.
   - Use torque wrench with setting of 20NM.

Annex 6: Datasheets of Procured Items

The Datasheets of Procured Items referred to as Annex 6 can be found on this link:

https://www.lcec.org.lb/node/12909