Request for Quotation (RFQ) for

Environmental and Energy Simulation for the EE-HBIM Design of Energy Rehabilitation

for the “Municipality of Tripoli” and the “Rashid Karami Municipal Cultural Center” Buildings

as part of the

“BIM for Energy Efficiency in the Public sector” Project

BEEP (A_B.4.31_0033)

Financed in the framework of the ENI CBC Mediterranean Sea Basin Programme 2014-2020

The enclosed document is prepared by the Lebanese Center for Energy Conservation (LCEC).
LCEC reserves the right to request additional information to be added to this RFQ.

May 2021 - Beirut, Lebanon

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Section 1: Introduction

A. Bid Overview

1. The objective of this Request for Quotation (RFQ) is for the Lebanese Center for Energy Conservation LCEC to select one Consultant to perform dynamic energy simulations of the historic buildings the ''Municipality of Tripoli'' and "Rashid Karami Municipal Cultural Center" which are the local case studies of the BEEP project.
2. The Rashid Karami Cultural Center is the detailed case study and the Municipality Building is the simple case. The available data for both buildings will be shared by the LCEC.
3. The case studies are shown in Annex 3 of this document.
4. The analyses are part of the BEEP project activity A 4.3.4: Environmental and Energy Simulation for the EE-HBIM Design of Energy Rehabilitation and they will contribute in the development of the dynamic energy simulation of the historic building along with the dynamic simulation of three energy-environmental improvement scenarios.
5. All information included in all the pages of this document and its Annex is an integral part of this RFQ.

B. Background Information

About ENI CBC Med Programme

6. ENI CBC Med is the largest Cross-Border Cooperation (CBC) initiative implemented by the European Union (EU) under the European Neighbourhood Instrument (ENI). Through calls for proposals, ENI CBC Med finances cooperation projects for a more competitive, innovative, inclusive and sustainable Mediterranean area.
7. The Programme has a budget of € 209 million for the 2014-2020 period and the Managing Authority (MA) is the Autonomous Region of Sardinia in Italy.

8. Some of the main challenges addressed by projects selected for funding in the framework of the programme are the creation of innovative start-ups, the development of Mediterranean-wide economic value chains, the diversification of tourism, technological transfer, the inclusion of women in the labour market, better management of waste, water and coastal areas, and the improvement of energy efficiency in public buildings.
9. For more information, please refer to the following website: http://www.enicbcmed.eu/about-us/the-programme-at-a-glance

About BEEP

10. Buildings are responsible for 36% of global final energy consumption and nearly 40% of total direct and indirect CO2 emissions. In such a challenging situation, renovating and making Mediterranean buildings smarter is of utmost importance to reduce the carbon footprint of our homes.
11. BIM for Energy Efficiency in Public sector (BEEP) Project aims at strengthening the use of Building Information Modelling (BIM) - a process supported by various tools and technologies involving the generation and management of digital representations of physical and functional characteristics of places - to enhance energy efficiency in buildings.
12. BEEP will provide public administrations with a powerful method for the energy rehabilitation of public buildings to be supported with private funds through the Energy Performance Contracting.
13. BEEP project aims to enhance the capacity of public local administrations to design, and realize innovative energy rehabilitation interventions on existing public buildings, by the mean of a multidisciplinary and integrated "Information and communications technology" (ICT) tool (BIM and performance-based design: EE-Heritage Building Information Modelling (HBIM) approach).
14. The testing of this emerging technology on built heritage will be performed to demonstrate its scalability to the entire building stock.

15. BEEP's main outcome will be an innovative methodology based on the integration of emerging technologies tested on heritage public buildings. The results will streamline the sustainable rehabilitation process and start a virtuous circle where the money saved by public administrations in managing public assets will be used to multiply the interventions on the existing building stock.
16. BEEP pilot actions will contribute to an open, competitive digital market for construction and will encourage wider collaboration between the public and private sectors for further collective action.
17. BEEP will facilitate the wider introduction of Building Information Modelling in the public sector as a strategic enabler and the adoption of an aligned framework for its introduction into the built environment and construction sector. This alignment will accelerate growth and support competitiveness of the construction sector, especially in SMEs.
18. BEEP implementation period is 36 months (starting date 1/09/2019 – ending date 1/09/2022).
19. For more information about BEEP, please refer to the following website: http://www.enicbcmed.eu/Projects/beep

About LCEC

20. The Lebanese Center for Energy Conservation (LCEC) is an independent organization at the Ministry of Energy and Water in Lebanon. It is a technical point of reference specialized in renewable energy and energy efficiency.
21. 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.

22. LCEC provides both the public and private sector with expert advice, finance and accreditation, develops energy efficiency standards and labels, and provides national energy database indicators.
23. For more information about LCEC, please refer to the following website: http://lcec.org.lb/

Section 2: Responsibilities and Expected Deliverables

A. Objectives

24. The objective of this Request for Quotation (RFQ) is for LCEC to select one Consultant to perform dynamic energy simulations of the historic buildings the ''Municipality of Tripoli'' and "Rashid Karami Municipal Cultural Center" which are the local case studies of the BEEP project.
25. The purpose of this activity is to define recommendations for improving heritage buildings' energy performance and comfort conditions by taking into account the passive design aspects of the building and enhancing its distinctive features that are closely linked with its climate and microclimate context.
26. The dynamic simulations along with any necessary analyses and modelling to be carried out by the Consultant will help simulate the energy and environmental performance of the existing case-study building and the performance of three environmental and energy retrofit scenarios.
27. The short-term scenario corresponds to ephemeral and most cost effective interventions.
28. The middle-term scenario reflects a deeper renovation with longer payback-period.
29. Finally, the long-term scenario will pursue the best available technologies compatible with the building that allow the best energy and environmental improvement albeit at the cost of an even more efficient payback time.

30. The HBIM digital model may be used as a basis for drafting the digital energy model that will be used for the simulations.
31. The environmental monitoring, as well as the walkthrough energy audit data previously performed will be used for the calibration of the digital model.
32. The calibrated digital model of the existing building will then be used for the subsequent simulation of the energy retrofit scenarios.
33. The LCEC will provide the information for the existing case study simulation, and then, based also on the "ante operam" simulation results will develop together with the consultant the general outline of the retrofit scenarios where final adjustments will be made according to the simulation results in each case.
34. The consultant shall provide a detailed description of the energy calibration strategy and of all the calculation, trial and errors, performed.

B. Ongoing Activities

35. Geometric survey based on 3D scanning for both buildings is finalized.
36. A detailed general conservation state visual analysis for the Rashid Karami building is being finalized.
37. A simple general conservation state visual analysis for the Municipality building is available.
38. Opaque and transparent envelope and indoor environment analyses are being currently performed on Rashid Karami building.
39. Simple data related to Opaque and transparent envelope and indoor environment analyses of the Municipality Building is available.
40. Development of a virtual model using HBIM process is being performed for both buildings.

C. Required Activities

41. The activities in this RFQ are divided in 5 stages.
42. Stage 1:pre-planning includes providing the current buildings information to the Consultant
43. Stage 2: data verification & modeling aims at confirming the validity of the data up to a certain degree. The data/information is based mainly on the technical documentation survey performed by LCEC.
44. Stage 3: simulation results of the current situation of the building. Based on the whole analysis process and on the integrated design process previously performed by the LCEC, three renovation scenarios (Long, mid and short term) are suggested.
45. Stage 4: verification of renovation scenarios by the Consultant in order to conduct the dynamic simulation which is stage 5.
46. The developed HBIM model, currently a process still under development will be provided to the Consultant (upon request, if he needs it to obtain all the necessary building information (geometrical & alphanumerical).
47. The Consultant together with LCEC will decide either to remodel the entire building in the energy simulation software or to export the native BIM file to a compatible format that may work with the energy software he is working with and proceed with the energy simulation.

Stage 1: Pre-planning

48. Prior to performing the dynamic energy simulations, the LCEC should conduct pre-planning meetings with the awarded Consultant to discuss the activity objectives, security or access constraints, mobilization strategy and more details regarding (as described in EN 16247-2):
    a. Activity objectives: A clear and concise scope of the activities should be established at this stage with a detailed list of the simulations to be performed,

the results accuracy and the performance indicators, as well as the required format of the deliverables. Clear definition of each simulation case to be investigated.

b. Mobilization strategy.

Stage 2: Input data verification and modelling

49. During the pre-planning activities the Consultant will receive from the LCEC the following data in the respective forms:
    a. available energy and environmental related data in the form of spreadsheets (.xls or other database file format);
    b. the geometry of the building in CAD format;
    c. upon request, the native HBIM model, with the complete energy-related metadata integration (e.g. all the single instances of walls with their thermophysical characteristics, the windows, generators, terminals, etc. in specific schedules in which each single object is defined).
50. The Consultant shall then verify the data with in-situ survey and collect further information, if deemed necessary, in order to complement the input data required for the drafting of the energy model.

Stages 3 and 4: Model calibration and dynamic simulation of the existing building

Simulation software

51. The simulation software should be the latest version of DesignBuilder.

Climate file

52. A compatible climate file with the simulation software shall be used, representing the long-term average climatic conditions of the buildings' location (e.g. Typical Meteorological Year 2 (TMY2), Weather Year for Energy Calculations 2 (WYEC2) etc.). The climate file can be either extracted from national databases or online weather data repositories or created based on detailed outdoor environmental

monitoring according to EN ISO 15927-4. For the DesignBuilder software, it is necessary to have .epw climate file along with .stat file. The selection of the climate file will be discussed with the LCEC during the pre-planning activities.

Model Calibration

53. In case the historic building employs HVAC systems, the prime calibration parameter will be the energy consumption (kWh) on an annual and monthly basis. For this purpose, the current Energy Bills, or data deriving from energy meters shall be used. The tolerance range proposed by the ASHRAE Guideline 14 (2014)[1] and relevant literature[2] will be accepted.
54. As explained previously, the level of data available for each case study is different. Based on the indoor environmental monitoring of specific zones of the building, the calibration process will be also based on the comparison of simulated and measured data (of the indicated zones and for the particular monitoring period). The statistical indicators of mean absolute error, MAE, and root mean square error, RSME, shall be used. The first indicator represents the standard deviation of the differences between measured and simulated data, while the second one takes into account the average absolute error of the differences between measured and simulated values.
55. Two different accuracy levels LV 1 (high accuracy) and LV 2 (low accuracy) are suggested. The tolerance range for temperature and relative humidity of the narrower range of accuracy (Lv. 1) and the wider range of accuracy (Lv. 2) are:
    c. Lv. 1: Temperature: ± 1 °C and Relative Humidity: ± 5%.
    d. Lv. 2: Temperature: ± 2 °C and Relative Humidity: ± 10%

[1] ANSI/ASHRAE, ASHRAE Guideline 14-2014 Measurement of Energy and Demand Savings, 2014.
[2] Huerto-Cardenas, H. E., Leonforte, F., Aste, N., Del Pero, C., Evola, G., Costanzo, V., et al. (2020). Validation of dynamic hygrothermal simulation models for historical buildings: State of the art, research challenges and recommendations. Building and Environment, 180, 107081. doi:https://doi.org/10.1016/j.buildenv.2020.107081

56. Additional **optional** uncertainty indices that can be used and their corresponding thresholds of accuracy, according to the literature3, are:
    e. Coefficient of determination, R2, where R2 > 0.75
    f. Inequality coefficient, IC, where IC < 0.25

Dynamic simulation of the existing building (or the base-case model)

57. For the performance of the dynamic energy simulation the following specifications shall be met: Spaces should follow the same naming convention to the one followed in HBIM model (Unique 3-digit number).

Deliverables

58. The deliverables of the energy model validation stage consist in:
    a. the digital file of the validated model of the existing building or the equivalent base-case model,
    b. a technical PDF report that presents the input data (focus on potential deviations from the data provided by the LCEC), the methodology that was adopted regarding the modelling of the building (distribution of thermal zones, adopted modelling process and analysis settings applied for the simulation), the results of the validation indicators and documentation on the overall accuracy of the model.
    c. an .XML file (exported from the simulation software) to be used for the CDE (Common data environment).

3 Huerto-Cardenas, H. E., Leonforte, F., Aste, N., Del Pero, C., Evola, G., Costanzo, V., et al. (2020). Validation of dynamic hygrothermal simulation models for historical buildings: State of the art, research challenges and recommendations. Building and Environment, 180, 107081. doi:https://doi.org/10.1016/j.buildenv.2020.107081

Stage 5: Dynamic simulation of the retrofit scenarios.

59. Following the modelling of the existing building or the equivalent base-case model, and the model verification through the outlined steps and parameters to be considered, three energy retrofit scenarios will be examined.
60. All the scenarios will ensure the comfort within the building according to local and/or international regulations regarding the indoor environmental parameters of Temperature and Relative Humidity.
61. The short-term scenario corresponds to more cost-effective interventions from energy efficiency and payback-period point of view. The middle-term scenario will focus on a deeper renovation with more efficient payback-period. Finally, the long-term scenario will pursue the best available technologies that are compatible with the building and allow the best energy and environmental improvement, resulting at an even greater payback period.
62. The technologies applied and retrofit approach will be discussed with the LCEC prior to the simulation.
63. Preliminary simulation results of particular zones will be discussed with the LCEC in order to assist in the definition of the 3 retrofit scenarios (e.g. timeseries of indoor environmental parameters, such as Operative Temperature and Relative Humidity, discomfort hours etc.)
64. The indicators to be reported for the existing building (or the base-case scenario) and the three retrofit scenarios are the following:
    a. Final and primary energy demand per scenario (kWh/m^2 yearly),
    b. Energy consumption per energy source (on at least monthly steps) (kWh/m^2 yearly),
    c. Energy use or/and production from Renewable Energy Sources (RES) per system (on a monthly basis).

Deliverables

65. The deliverables of the dynamic energy simulation stage consist in the following:
    a. the digital files [.dsb] of the three retrofit scenarios;
    b. an excel file reporting the energy consumption per energy source in the given timestep;
    c. a technical PDF report that presents all the input variables with their uncertainty distributions and technical characteristics of the base-case model and the three retrofit scenarios as well as a comparative analysis of the results on a monthly and yearly basis (graphs and comparative tables summarizing the results of the three retrofit scenarios and the existing base-case model);
    d. the .XML files (exported from the simulation software) of the three retrofit scenarios, to be used for the CDE (Common data environment).
66. In addition, the consultant shall fill the template in Annex 4 as a final deliverable.
67. The consultant is expected to provide technical support on the energy model from the delivery date until the end of the BEEP Project (September 2022).
68. The expected deliverables for both case study buildings are provided in table 1 below.

Table 1: Deliverables

	Deliverables	Deadline
Energy model validation stage	• The digital file [.dsb] of the validated model of the existing building or the equivalent base-case model.	Four weeks following contract signature
	• A technical PDF report that presents the input data (focus on potential deviations from the data provided by the Employer), the methodology that was adopted regarding the modelling of the building (distribution of thermal zones, adopted modelling process and analysis settings applied for the simulation), the results of the validation indicators and documentation on the overall accuracy of the model.	
	• An .XML file (exported from the simulation software) to be used for the CDE (Common data environment).	
Dynamic energy simulation	• The digital files [.dsb] of the three retrofit scenarios.	Eight Weeks following contract signature
	• An excel file reporting the energy consumption per energy source in the given timestep.	
	• A technical PDF report that presents all the input variables with their uncertainty distributions and technical characteristics of the base-case model and the three retrofit scenarios as well as a comparative analysis of the results on a monthly and yearly basis (graphs and comparative tables summarising the results of the three retrofit scenarios and the existing base-case model)	
	• The .XML files (exported from the simulation software) of the three retrofit scenarios, to be used for the CDE (Common data environment).	
Final Report	Annex 4 of this RFQ	Twelve Weeks

General Notes

- 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.
- All calculations in the submitted reports should be checked for mathematical accuracy.
- The reports should include all calculations in unprotected MS Excel format.
- The reports should be comprehensive and written in proper prose. The language should be clear, concise and understandable.
- The simulation outputs need to be accompanied with quantitative and qualitative indicators.
- International System of Units (SI) must be used in all parts of the reports.

Section 3: Competences and Experience

70. The Consultant shall provide a brief description of three to five similar past projects as a proof of experience (see Form 3 in the Annex), in order to highlight:
    a. Technical capability – evidence of familiarity with a variety of software/hardware, ability to achieve high levels of accuracy required for the simulation and experience with a wide technical base of tools, equipment and processes appropriate to conduct the survey will demonstrate the aforementioned technical capability.
    b. Internal capacity – evidence of training and development (certificates), internal capabilities and program capacity to enable timely delivery are key criteria.
    c. Portfolio of relevant work.

Section 4: Requirements for Quotation

A. Documents to be Submitted

71. Annex 2 – Form 1 Letter of Application completed, signed, and stamped.
72. Annex 2 – Form 2 Team Composition and Tasks Assignment completed, signed, and stamped.
73. Annex 2 – Form 3 Competences and Experience
74. Annex 2 – Form 4 Financial Offer signed and stamped.
75. In response to this RFQ, the Consultant shall as well provide a method and resource statement. The document must include as a minimum:
    a. method proposed for providing the required data;
    b. number of and positions of staff to be employed on project, including project leader;
    c. simulation equipment, software, etc. to be used;

d. any proposed alternative analysis methods and their performance;
e. Proposed output resolution and media.

76. All documents relating to this RFQ shall be written in English language.
77. The quotation shall be signed by the bidder or a person duly authorized to bind the bidder to the contract. The latter authorization shall be indicated by written power-of-attorney to be attached to the proposal.
78. 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.

B. Financial Offer Requirements

79. The financial offer must be submitted as per Form 4 in Annex 2 in euros exclusive of VAT.
80. The offer shall be lower than 5,000 euros VAT exclusive.
81. If any item is needed for the required activities was not stated in the offer, then it is the bidder's responsibility to provide at no additional cost.

Section 5: Administrative Information

A. Procurement Timetable

82. The following dates are set forth for informational and planning purposes however, LCEC reserves the right to change the dates.

Issue RFQ	5 May 2021
Closing Date for Receipt of Quotations	26 May 2021
Announcement of Winning Bidder	Within 14 days of the closing date for receipt of quotations (except if received offers exceed assigned budget)
Contract Signature	Within 7 days of the announcement of winning bidder

B. Submission of Bid Proposal and Validity Period

83. Deadline for the submission of quotation is 26 May 2021 at 3:00 p.m.
84. Any quotation received after the mentioned date and time will be rejected.
85. Submittals must be sent in softcopies to energy@lcec.org.lb including the following in the email subject : **"BEEP Energy Simulation RFQ"**
86. 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.
87. For all questions, comments, suggestions, and clarifications regarding this request for quotation, communicate with LCEC ONLY by email to: energy@lcec.org.lb.
88. The period of validity of quotation is 120 days and it starts on the closing date for receipt of bid proposals.
89. In exceptional circumstances, LCEC may request the bidders to extend the validity of the proposal and quotation beyond what has been initially indicated in this RFQ.

C. Ammendment of the RFQ and Withdrawal of Bid Proposal

90. LCEC may, at its discretion, ask any bidder for a clarification of its proposal which shall be submitted within a stated period of time. Any request for clarification and all clarifications shall be in writing. 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.
91. 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.
92. The bidder may withdraw its bid proposal prior to the closing date for receipt of bid proposals by submitting a written request to withdraw to LCEC.

D. Costs of Preparing the Quotation

93. The costs of preparation and delivery of the quotation are solely the responsibility of the bidder.

E. Quotations Opening

94. The quotations will remain confidential until the Evaluation Committee has reviewed all of the responses submitted in response to this RFQ and the LCEC has announced a notice of intent to award a contract.

F. Disposition of Quotations

95. All information submitted by a bidder may be treated as public information by LCEC following the conclusion of the selection process. Commercially sensitive information may be made anonymous only if the bidder explicitly identifies it as commercially sensitive and detrimental to the bidder's financial or commercial position.

G. Reservation of Rights

96. 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, to:
    a. Modify or withdraw from the RFQ, or modify the provisions contained in the RFQ, for any reason;
    b. Select zero, one, or multiple bid proposal(s) in response to this RFQ in order to enter into negotiations or execute an agreement;
    c. Award contract to bidder(s) based on some or all criteria in this RFQ, or additional criteria not specified in this RFQ, or post-bid negotiations;
    d. Waive any material or immaterial non-conformity in any bid received;
    e. Reject parts of bid or entire bid for any reason;
    f. LCEC shall have no obligation to provide a reason for rejecting a bid;
    g. Issuance of this RFQ in no way constitutes a commitment by LCEC to award a contract.

H. Joint Ventures, Consortiums, and Associations

97. Given the scale of implementation, bids submitted by a joint venture, consortium or association of two or more firms as partners will not be accepted.

I. Health and Safety

98. The Consultant must ensure that all relevant safety requirements associated with the provision of survey on behalf of the LCEC are met during the contract period, following the relevant national and international regulation.
99. The Consultant's attention is brought to the need for best practice in matters of safety.

100. Equipment supplied or used by the Consultant or their agents must conform to the current safety standards, following the relevant national and international regulation.

J. Protection of property

101. The Consultant is responsible for the prevention of damage to property and/or the environment caused by his/her works or the actions of employees or people under his/her direct control. This includes responsibility to ensure security of property where the Consultant has been supplied keys for access to normally locked spaces or unattended areas and where no additional client security measures are in place.
102. The Employer should notify the Consultant of any restrictions in relation to the marking of survey control, vegetation clearance and security requirements.
103. The Consultant should be aware of the potential damage that survey and analysis marking can cause to structures, underground utilities and to the environment and take appropriate steps to mitigate this.

Section 6: Evaluation of Quotations

104. This section describes the evaluation process which will be used to determine the winning bidder.
105. The proposals shall be evaluated based on the following:
    a. Full acceptance to the contract terms and conditions;
    b. Experience and Competence of the consultancy firm and the staff involved in the project as per Form 2 in Annex 2;
    c. Lowest price.
106. LCEC shall disqualify proposals for any of the below reasons:
    a. The bidder fails to deliver the quotation by the due date and time;
    b. The bidder fails to respond to the LCEC request for information, documents, or references;
    c. The bidder fails to include any form, signature, certification, authorization, stipulation, disclosure or guarantee requested by LCEC;
    d. The bidder provides misleading or inaccurate responses.
107. LCEC reserves the right to negotiate the proposed financial offer with the winning bidder before signing the contract.
108. In case the winning bidder does not sign the contract within thirty (30) days of the announcement of the award, then the LCEC reserves the right to disqualify the winning bidder and choose the next bidder.

Section 7: Contract Terms and Payments

109. The financial offer must be submitted as per Form 4 in Annex 2 in euros exclusive of VAT.

A. Method of payment

110. LCEC shall effect payments to the winning bidder after acceptance by LCEC of the invoices submitted by the Consultant, upon achievement of the corresponding milestones of the project.
    a. (20%) of Contract price upon Contract signature and the submittal of the comprehensive planning of activities by the Consultant.
    b. (35%) of Contract price upon the accomplishment and delivery of the Deliverables of the energy model validation stage.
    c. (35%) of Contract price upon the accomplishment and delivery of the Deliverables of the dynamic energy simulation.
    d. (10%) of Contract price upon final completion and the accomplishment and delivery of all pending Deliverables.

B. Contract Period and Penalties

111. Four (4) weeks for Delivery from the commencement date until the Handover date for Deliverables of the Energy Model Validation Stage.
112. Eight (8) weeks for Delivery from the commencement date until the Handover date for Deliverables of the Dynamic Energy Simulation.
113. Twelve (12) weeks for Delivery from the commencement date until the Handover date for the Final Report as per Annex 4.
114. Technical support on the energy model from the delivery date until the end of the BEEP Project (September 2022).

115. The maximum period of delay for this contract will not be more than one (1) month, after that, LCEC has the right to terminate the contract or take any other action it deems necessary to complete the works.

Annex 1 – General Terms and Conditions

Legal Status

116. The Consultant shall be considered as having the legal status of an independent consultant vis- à-vis LCEC. The Consultant's personnel and sub-contractors shall not be considered in any respect as being the employees or agents of LCEC.

Sources of Instructions

117. The Consultant shall neither seek nor accept instructions from any authority external to LCEC in connection with the performance of the services under this contract. The Consultant shall refrain from any action which may adversely affect LCEC and shall fulfill its commitments with the fullest regard to the interests of LCEC.

118. The Consultant 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 Consultant at any time use such information to private advantage. These obligations do not lapse upon termination of this contract.

Observance of the Law

119. The Consultant 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.

Settlement of Disputes

120. 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.

Termination of Contract

121. LCEC reserves the right to terminate without cause this contract at any time upon 15 days prior written notice to the Consultant, in which case LCEC shall reimburse the Consultant for all reasonable costs incurred by the Consultant prior to receipt of the notice of termination.
122. In the event of any termination by LCEC as per the above, no payment shall be due from LCEC to the Consultant except for work and services satisfactorily performed in conformity with the express terms of this contract. The Consultant shall take immediate steps to terminate the work and services in a prompt and orderly manner and to minimize losses and further expenditures.
123. Should the Consultant be adjudged bankrupt, or be liquidated or become insolvent, or should the Consultant make an assignment for the benefit of its creditors, or should a receiver be appointed on account of the insolvency of the Consultant, LCEC may, without prejudice to any other right or remedy it may have, terminate this contract forthwith. The Consultant shall immediately inform LCEC of the occurrence of any of the above events.

Authority to Modify

124. No modification or change in this contract, no waiver of any of its provisions or any additional contractual relationship of any kind with the Consultant shall be valid and enforceable against LCEC.

Assignment

125. The Consultant shall not assign, transfer, pledge or make other disposition of this contract or any part thereof, or any of the Consultant's rights, claims or obligations under this contract except with the prior written consent of LCEC.

Consultant 's Responsibility for Employees

126. The Consultant 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.

Sub-Contracting

127. In the event the Consultant requires the services of sub-contractors, the Consultant 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 Consultant of any of its obligations under this contract. The terms of any sub-contract shall be subject to and conform with the provisions of this contract.

Title to Equipment

128. 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 Consultant. Such equipment, when returned to LCEC, shall be in the same condition as when delivered to the Consultant, subject to normal wear and tear. The Consultant shall be liable to compensate LCEC for equipment determined to be damaged or degraded beyond normal wear and tear.

Confidential Nature of Documents and Information

129. All maps, drawings, photographs, mosaics, plans, reports, recommendations, estimates, documents and all other data compiled by or received by the Consultant 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.

Officials Not to Benefit

130. The Consultant warrants that no official of LCEC has received or will be offered by the Consultant any direct or indirect benefit arising from this contract or the award thereof. The Consultant agrees that breach of this provision is a breach of an essential term of this contract.

Indemnification

131. The Consultant 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 Consultant, or the Consultant'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 Consultant, its employees, officers, agents, servants or sub-contractors. The obligations mentioned herein do not lapse upon termination of this contract.

Encumbrances/Liens

132. The Consultant 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 Consultant.

Use of Name, Emblem or Official Seal

133. The Consultant shall not advertise or otherwise make public the fact that it is a Consultant with LCEC, nor shall the Consultant, 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.

Copyright, Patents and Other Proprietary Rights

134. 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 Consultant 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.

Force Majeure; Other Changes in Conditions

135. Force majeure, as used herein, 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.

136. In the event of and as soon as possible after the occurrence of any cause constituting force majeure, the Consultant shall give notice and full particulars in writing to LCEC, of such occurrence or change if the Consultant is thereby rendered unable, wholly or in part, to perform its obligations and meet its responsibilities under this contract. The Consultant 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 Consultant to be taken including any reasonable alternative means for performance that is not prevented by force majeure. On receipt of the notice required herein, 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 Consultant of a reasonable extension of time in which to perform its obligations under this contract.

137. If the Consultant 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 following a period of notice of seven (7) days.

Child Labour

138. The Consultant 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 Consultant, at no cost to the LCEC.

Corrupt and Fraudulent Practices

139. Anticorruption Policy requires bidders, suppliers, consultants 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.

140. 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.
141. 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.

Conflict of Interest

142. 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, consultants 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 proposal; 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 bidder in the subsequent bidding process or influence the decisions of LCEC regarding this bid process; or

e. participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of this RFQ. 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 RFQ, unless it can be demonstrated that there is no significant degree of common ownership, influence or control.

Annex 2 - Forms

Form 1 - Letter of Application

Date of Application **09 April 2021**

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: "Request for Quotation for Environmental and Energy Simulation for the EE-HBIM Design of Energy Rehabilitation for the "Municipality of Tripoli" and the "Rashid Karami Municipal Cultural Center" Buildings"

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

(a) We have examined and have no reservations to the most recent version of the RFQ 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 RFQ;

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

(d) We understand that you may, without incurring any liability to the applicants, a) cancel the RFQ at any time and b) accept no proposal or invite no applicant to sign the installation 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;

(e) 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 capacity of person signing the Application]*

[Insert full name of main Applicant]

[Insert full address]

[Insert date of submission]

Form 2 - Team Composition and Tasks Assignment

Team Member Name	Position in this Assignment	Assigned Task

Form 3 – Competence and Experience

Building Information (year of construction size in m², main use and location)	Year of conducting the project	Environmental or/and energy monitoring (measurements/surveys conducted in the field)	Dynamic energy simulation (Software used for modelling and for simulation)	Indicators of energy performance used in the deliverable

Form 4 –Financial Offer

	Deliverables	**Price (Euros)**		
Activities	**Case Study**	**Municipality Building**	**Rashid Karami Building**	**Both buildings**
Energy model validation stage **Due date: 1 month following contract signature**	The digital file [.dsb] of the validated model of the existing building or the equivalent base-case model.			
	A technical PDF report that presents the input data (focus on potential deviations from the data provided by the Employer), the methodology that was adopted regarding the modelling of the building (distribution of thermal zones, adopted modelling process and analysis settings applied for the simulation), the results of the validation indicators and documentation on the overall accuracy of the model.			
	An .XML file (exported from the simulation software) to be used for the CDE (Common data environment).			
Dynamic energy simulation **Due date: 2 month following contract signature**	The digital files [.dsb] of the three retrofit scenarios.			
	An excel file reporting the energy consumption per energy source in the given timestep.			
	A technical PDF report that presents all the input variables with their uncertainty distributions and technical characteristics of the base-case model and the three retrofit scenarios as well as a comparative analysis of the results on a monthly and yearly basis (graphs and comparative tables summarising the results of the three retrofit scenarios and the existing base-case model)			
	The .XML files (exported from the simulation software) of the three retrofit scenarios, to be used for the CDE (Common data environment).			
Total				

Annex 3 – Case Studies

Case Study 1: Municipality of Tripoli Building

The building is composed of two sections, one old and one new. This survey and study tackles only the old building as it is the historical one.

Name of Building: Municipality of Tripoli
Location: Tripoli – North Lebanon
Floor area: ~ 1436 m^2
Volume: ~ 21540 m^3
Original use: Municipality
Year of Construction: ~1932

Figure 1 Drone picture of the Municipality of Tripoli

Case Study 2: Rashid Karami Municipal Cultural Center

Name of Building: Rashid Karami Municipal Cultural Center (commonly known as "Nawfal Palace")
Location: Tripoli – North Lebanon
Floor area: ~ 600 m^2
Volume: ~ 4321 m^3
Original use: Public and archival library
Year: ~1898

Figure 2 Drone picture of the Rashid Karami Municipal Cultural Center

Annex 4 – Final Report Template

1. General introduction of the software and the calculation method

[briefly describe the chosen software and its main features like calculation method and regulatory compliance]

2. Model input data (ante-operam)

- **Introduction**

[brief description of the input data used by the software]

- **Weather data**

[brief description of the weather data, the data present, data format, source of data, choice of data and related reasoning]

- **Thermal zones and user schedule**

[brief description of the thermal zone definition of the building and of the occupancy schedules used. Highlight the reasoning behind the thermal zones definition and the source of occupancy schedules]

- **Shell and Interiors parameters**

[brief description of the parameters of the envelope (exterior vertical and horizontal enclosures - opaque and transparent), interiors (if relevant), please refer to the model element table. Highlight thermal bridges (if any) and how they are calculated (if they are)]

- **Building Geometry**

[brief description of how the abstract geometry of the energy model was reached from the real geometry of the building. Also include specific reflections relating to the thermal representation of the historic building (simplification of complex elements, methods of working with the masses, etc.)]

- **Building Systems**

[brief description of the modelled systems (heating, cooling, lighting, ventilation, RES, storage etc..) and their modelling strategy]

3. Ante-operam Energy Model calibration

Description of the energy calibration strategy and of all the calculation, trial and errors, performed.

4. Ante operam Energy simulation results

Description of the results of the ante-operam model including free running simulation results to help comprehend and evaluate the passive behaviour of the building including:

- *comfort (just to check country regulatory compliance);*
- *global primary energy demand Ep,gl;*
- *energy performance consumption for each sources involved in the scenarios or for energy use;*
- *energy production from renewable energy sources (RES);*
- *Free running analysis of temperature and relative humidity in specific thermal zones (useful for the design of the intervention scenarios)*

5. Energy modelling and simulation results of the scenarios (post-operam)

Description of the input data for each energy improvement scenarios and of the yearly energy simulation results (and monthly - if useful) in terms of:

- *comfort (just to check country regulatory compliance);*
- *global primary energy demand Ep,gl;*
- *energy performance consumption for each sources involved in the scenarios or for energy use (keep in mind to obtain data to ease the calculation of the related energy bills);*
- *energy production from renewable energy sources (RES).*

- **Short term scenario modelling and results**
- **Middle term scenario modelling and results**
- **Long term scenario modelling and results**

6. Annexes

[depending on the software insert here all the spreadsheets and the calculation performed]