

Republic of Lebanon  
Ministry of Energy and Water



Call for Expression of Interest (EOI)  
to Participate in Proposal Submissions  
of Solar Photovoltaic (PV) Farms with Energy  
Storage in Lebanon

April 2018  
Prepared by the Lebanese Center for Energy Conservation (LCEC)  
Beirut, Lebanon

# A. Introduction

1. This Expression of Interest (EoI) is for the Government of Lebanon (GoL) - Ministry of Energy and Water (MEW), on behalf of Electricité du Liban (EdL), to receive interest from different parties in potentially procuring renewable electricity (RE) from Solar Photovoltaic (PV) farms with the addition of a Battery Energy Storage system. This EoI is for interested parties to develop a total of 3 Solar PV farms with Battery Energy Storage adding up to 210 MWp – 300 MWp at various locations throughout Lebanon as selected by the developers, the sites being expected to receive the licenses to operate in 2019.
2. In each project, the minimum power capacity of one given Solar PV farm is 70 MWp and the maximum power capacity is 100 MWp with Battery Energy Storage of minimum of 70 MW power with a minimum of 70 MWh of storage capacity, regardless of the Solar PV sizing.
3. The submission of the EoI is on Thursday July 12<sup>th</sup>, 2018 at 12:00 noon. Proposals must be delivered and registered at the office of the Minister of Energy and Water, Ministry of Energy and Water (MEW), 2<sup>nd</sup> Floor, Corniche du Fleuve, Beirut, Lebanon.
4. It should be noted that the interested parties will, in due time, respond to a formal Request for Proposal (RFP) whereby selected contractor(s) will finance, develop, acquire land, design, provide all permits, build, own, operate, maintain, decommission, and in general be responsible for all other aspects of the Solar PV farm and its Battery Energy Storage component. The Solar PV farms will deliver electricity to the EdL network/grid.
5. This proposed initiative will eventually contribute in increasing the share of the renewable energy production in Lebanon, specifically regarding the upcoming period 2021-2025.

## B. Background

6. Historically, Lebanon relies essentially on oil imports as its main resource for energy production. During the 2010 baseline year, the total fuel imports to Lebanon (liquid gas, gasoline, gas oil, fuel oil, kerosene, and asphalt) amounts to approximately 5,768 ktoe (5,768,269.94 toe) and are consumed in the different sectors in Lebanon.
7. In terms of electricity, the average available electricity production capacity in 2009 (including imports) was 1,500 megawatts (MW) while the average demand was 2,000–2,100 MW. The instantaneous peak demand in the summer of 2009 was estimated at 2,450 MW. The total energy demand in 2009 was 15,000 gigawatt-hours (GWh) although the total produced energy (including imports) was 11,522 GWh. Accordingly, the electric energy deficit in Lebanon was estimated to be 3,478 GWh.
8. In Lebanon, electricity is basically generated from thermal and hydroelectric power plants. Approximately 7.5% of the total electricity production in 2009 was purchased from Syria (589 GWh) and Egypt (527 GWh) through regional interconnections.
9. In addition to the deficit in electricity supply, the Lebanese electricity sector was facing several problems such as load shedding, technical losses, and the aging of power plants. This situation resulted in technical and financial impacts on customers, the Government, and the entire economy.
10. The Lebanese end-users were forced to rely on diesel generators to overcome the electricity shortages. To overcome all these problems, MEW published a comprehensive energy policy (the 2010 *Policy Paper for the Electricity Sector*) that was approved by the Council of Ministers (COM) on June 21, 2010.
11. In 2009, at the fifteenth session of the Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen, Denmark, the Lebanese Government made a pledge to develop Renewable Energy (RE) production capacity to reach 12%.
12. This political commitment was a major milestone of the Policy Paper for the Electricity Sector. Adopted as the national strategy for the electricity sector by the Government on June 21, 2010, the policy paper clarified the national target as being 12% of the total electricity and thermal supply by 2020.

13. The Policy Paper for the Electricity Sector clearly states “this policy commits to launching, supporting, and reinforcing all public, private and individual initiatives to adopt the utilization of renewable energies to reach 12% of electric and thermal supply”.
14. The Council of Ministers (COM) of Lebanon also adopted the National Energy Efficiency Action Plan (NEEAP) for Lebanon on November 10, 2011 (Decision Number 26).
15. NEEAP 2011–2015 includes 14 initiatives that tackle energy efficiency and renewable energy, and focuses on the importance of developing technologies such as solar photovoltaic, wind, hydro, and others.
16. The Second National Energy Efficiency Action Plan for the Republic of Lebanon (NEEAP 2016–2020) continues and builds on the energy efficiency initiatives proposed in the first NEEAP 2011–2015. On the other hand, the National Renewable Energy Action Plan for the Republic of Lebanon (NREAP 2016–2020) continues and builds on the renewable energy initiatives proposed in the first NEEAP 2011–2015.
17. The NREAP 2016–2020 includes only measures dealing with renewable energy and includes several scenarios in the development of RE in Lebanon. Given that the projected total electricity and thermal supply in 2020 is approximately 6,389 ktoe, the national objective of Lebanon would be to implement renewable energy projects that would actually produce approximately 767 ktoe in 2020 (767 ktoe is 12% of 6,389 ktoe).
18. The MEW considers the above targets as achievable especially that the momentum for RE in Lebanon has already started as per the below.
19. On the 30<sup>th</sup> of October 2017, 42 bids for solar PV farms were received by the Ministry of Energy and Water after a call for expressions of interest, and a request for proposals that was launched in May 2017 to build solar PV farms totaling up to 180 MWp. A total of 12 bids will be selected each with a capacity between 10 and 15 MWp with the following expected geographical distribution:
  - Mount Lebanon: 30 to 45 MWp
  - North: 30 to 45 MWp
  - South and Nabatieh: 30 to 45 MWp
  - Bekaa: 30 to 45 MWpBy 2020, it is expected to have at least 180 MWp of installed capacity of solar PV farms in Lebanon.

20. On November 2<sup>nd</sup> 2017, the COM approved the permits for three wind farms in Akkar, following a call for expressions of interest, a request for proposals, an evaluation by an inter-ministerial committee assisted by international consultants, and a joint proposal by the Minister of Energy and Water and the Minister of Finance. On February 1<sup>st</sup> 2018, the Power Purchase Agreement (PPA) with the three wind farm developers was signed. The 200 MW of installed capacity of wind farms in Lebanon is expected by 2020.
21. This Expression of Interest (EoI) is for 3 Solar PV farms with Battery Energy Storage adding up to 210 – 300 MWp at various locations throughout Lebanon is one of many initiatives in the country aiming at procuring renewable electricity (RE) from the private sector.
22. The Ministry of Energy and Water (MEW) is the main public party responsible for the country's electricity sector in terms of strategy, policy, and planning. EDL, on the other side, being a public institution under the supervision of MEW, is tasked with the management of the sector.
23. As per Law 462 (September 2002), the private sector is allowed to generate electricity with a need for a license when the generation is with the intension to sell the electricity to the national network of EdL through a Power Purchase Agreement (PPA).
24. Law 288 (April 2014) amended Law 462 and added that “temporarily and for a duration of two years and until the appointment of the Electricity Regulatory Authority (ERA) and its assumption of its mandate, permits and licenses are granted through a decision from the Council of Ministers based on a joint proposal from the Minister of Energy and Water and the Minister of Finance”.
25. Law 54 (October 2015) extends the duration of Law 288 until April 2018.
26. Given the increased momentum in the renewable energy sector as a result of the recent implementation of Laws 288 (2014) and 54 (2015), the Ministry of Energy and Water is aiming at proposing a further extension of Law 288 in order to reach and exceed its RE targets for 2020.
27. The proposed project relies on the application of the laws 288 (2014), 54 (2015), and their future extension, to allow the private sector to generate electricity in the renewable energy sector solely and exclusively. This would mean allowing the private

sector to produce RE and export electricity to the national grid following the approval of the Council of Ministers and based on the joint proposal of the MEW and the Ministry of Finance.

## D. Instructions to Potential Developers

28. Private investors and companies interested to submit Expression of Interest (EOI) in reply to this call, are requested to take the following points into consideration:
29. The objective of this call for EOIs is for the Government of Lebanon – MEW, on behalf of EDL, to procure RE utilizing a Power Purchase Agreement (PPA).
30. The private sector entity will finance, develop, acquire land, design, build, own, operate, and maintain the RE plant, and in general be responsible for all other aspects of the operation. The RE farm will deliver electricity to the EDL network/grid.
31. EDL with approval of MEW will contract to purchase the electrical energy for a period of 20 years subject to terms and conditions defined in the PPA agreement. MEW or EDL does not intend to purchase the RE assets.
32. The contractor will deliver electricity to a location that is mutually agreed to by the contractor and MEW/EDL. The contractor will build the feeder line, substation (or upgrade an existing substation), and all other infrastructure required to deliver energy into an existing transmission line.
33. The delivered energy will meet the quality standards and requirements as per the Solar PV grid interconnection code for Lebanon.
34. The contractor will provide real-time energy production, forecasts and related data to EDL's national control centre/dispatch centre.
35. Bidder shall submit unit price for each kilowatt-hour of electricity in USD, annual amount of minimum, average and maximum kilowatt-hours delivered to the grid, date of full operation of the RE plant, and other requested information.
36. The total of 210 – 300 MWp is expected to be divided into three projects of each ranging from 70 MWp to 100 MWp.
37. Each developer will propose a suitable geographical location and secure the required land area for the PV plant and the Battery Energy Storage. The Solar PV plant and the Battery Energy Storage should be co-located on the same plot.

38. In each project, the minimum power capacity of one given Solar PV farm is 70 MWp and the maximum power capacity is 100 MWp with Battery Energy Storage of minimum of 70 MW power with a minimum of 70 MWh of storage capacity, regardless of the Solar PV sizing.
  
39. The proposed PPAs will be based on the lowest price received from the lowest bidder in all Lebanon with a sound administrative, technical, and environmental proposal.



## **E. Submission of Expression of Interest (EOI)**

40. Submitted EOI's must focus on the following points:
41. Clear description of the bidder: the bidder shall identify the lead developer, its relationship to a parent company (if any) and any other firms that comprise the joint-venture. Each bidder shall provide a statement from each joint-venture member that the lead developer is authorized to act on their behalf.
42. Project description: location with coordinates being displayed on a map, project capacity and estimated generation per year, technical specifications, environmental assessment and mitigation plans, and electric grid integration plans at the proposed location.
43. Technical capability and experience of the bidder: the bidder shall provide evidence of having the technical capability to manage the design, engineering, construction and operation of the Solar PV farm and Battery Energy Storage project of similar capacities.
44. Ability to raise debt and equity: the bidder must clearly demonstrate its ability to obtain sufficient funds to develop the project. The bidder must illustrate its previous successful experience in raising sufficient debt participation and substantial equity participation for renewable energy projects.
45. Timeline: the deadline for submission of the EoI is on Thursday July 12<sup>th</sup> , 2018 at 12:00pm. Proposals must be delivered and registered at the office of the Minister of Energy and Water, Ministry of Energy and Water (MEW), 2<sup>nd</sup> Floor, Corniche du Fleuve, Beirut, Lebanon.

## F. Application Form

46. Each developer is requested to complete the table below.

Ref.	Subject	Proposal
1	Company Name	
2	Country	
3	Full Address	
4	Phone Numbers	
5	Official Email Address	
6	Official Representative Mobile	
7	Company Profile (add attachments if needed)	
8	Company Turnover (USD)	
9	Proposed Site Location (ownership or rental) (add attachments if needed)	
10	Grid Connections Requirements (presence of MV or HV) (add attachments if needed)	
11	Manufacturer(s) of Equipment (panels, inverters, mounting structure, batteries, and inverters)	
12	Proposed Battery C rating	
13	Proposed Battery Power Storage	

	(MW) and Energy Storage (MWh)	
14	Proposed Battery Depth of Discharge (%)	
15	Proposed Battery Life Span (total number of cycles per life cycle)	
16	Battery operation regime (cycles per day and per year)	
17	Total Proposed Capacity (MW)	
18	Minimum Proposed Generation (MWh/year) (add attachments if needed)	
19	Solar PV farm Footprint (m <sup>2</sup> )	
20	Energy Storage Footprint (m <sup>2</sup> )	
21	Availability of Solar Irradiation Measurements	
22	Availability of an Environmental Social Impact Assessment (ESIA)	
23	Lead Time for Construction (Months)	
24	Lead Time for First Synchronization to the Grid (Months)	
25	Lease Duration (minimum and maximum, in years) (add attachments if needed)	

26	Any additional relevant information	
----	-------------------------------------	--

47. Note: The Ministry of Energy and Water reserves the right to request additional information to be added to the list.