

Call for Expression of Interest (EOI) to Participate in Proposal Submissions to Build and Operate Hydroelectric Plants in Lebanon

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1. Introduction

In Lebanon, electricity is generated from thermal and hydroelectric power plants.

The country relies essentially on oil imports as a main source for energy production. During the 2010 baseline year, total fuel imports (including liquid gas, gasoline, gas oil, fuel oil, kerosene, and asphalt) amounted to approximately 5,768 ktoe (5,768,269.94 toe) supplying the different sectors.

In 2010, hydroelectricity production by the different hydro power plants amounts to 836,537 MWh (equivalent to 180,909 toe). Also, the amount of energy produced by solar water heaters amounts to 12,719 toe (Reference NEEAP or NREAP).

Accordingly, the total consumption in 2010 equaled 6,069,301 toe, out of which 96.8% were imported from outside Lebanon and the remaining (3.2% from hydro and SWH) were locally produced.

The average available electricity production capacity in 2009 (including imports¹) 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) while the total generated energy (including imports) was 11,522 GWh. Accordingly, the electric energy deficit was estimated to be 3,478 GWh.

In addition to the deficit in electricity supply, the Lebanese electricity sector was, and still is, facing several problems such as load shedding, technical losses, and aging of power plants. This situation results in technical and financial impacts on customers, the Government, and the entire economy. For that reason, Lebanese end-users are forced to rely on diesel generators to overcome the electricity shortages. However, to resolve the problems of the energy sector, MoEW set a comprehensive energy policy (the 2010 *Policy Paper for the Electricity Sector*) that was approved and adopted by the Council of Ministers (COM) on June 21, 2010.

2. Policy Background

At the United Nations Framework Convention on Climate Change (UNFCCC) COP 15 meeting in Copenhagen, the Lebanese Government made a pledge to develop Renewable Energy (RE) production capacity to reach 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, the policy paper clarified the national target as being 12% of the total electricity and thermal supply by 2020.

The Policy Paper 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”.

¹ approximately 7.5% of the total electricity production in 2009 was purchased from Syria (589 GWh) and Egypt (527 GWh) through regional interconnections.

The Council of Ministers (COM) also adopted the National Energy Efficiency Action Plan (NEEAP) on November 10, 2011 (Decision Number 26). NEEAP 2011–2015 includes 14 initiatives that tackle energy efficiency and renewable energy.

The Second National Energy Efficiency Action Plan (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 (NREAP 2016–2020) continues and builds on the renewable energy initiatives proposed in the first NEEAP 2011–2015.

The NREAP 2016–2020 includes measures dealing with renewable energy and several scenarios for the development of RE in Lebanon. Given that the total projected electricity and thermal supply in 2020 is 6,389 ktoe, the national objective would be to implement RE projects that would produce 767 ktoe in 2020 as mentioned in the NREAP 2016–2020.

Lebanon is blessed with relatively rich water resources in terms of precipitation, averaging approximately 823 millimeter (mm) annually. However, significant annual variations exist among the different regions: 600 - 1000 mm in the coastal area; 900 - 1,700 mm in the western mountain range; 500 - 900 mm in the eastern mountain range; and 200 - 900 mm in the Bekaa Valley (JICA, 2003). Much of this precipitation is lost to evaporation, to neighboring countries, and to the Mediterranean Sea, while a relatively small percentage remains available as underground and surface water. Furthermore, statistical analysis of annual precipitation based on 80 years observation shows a decreasing tendency starting from the year 1970 (JICA, 2003).

All the hydro power plants were constructed before 1970. Lebanon has an approximate installed hydropower nominal capacity of 280 MW, with the Litani River Authority (LRA) managing approximately 190 MW of this capacity along the Litani-Awali Rivers. Currently, the electricity produced from the hydro plants constitutes nearly 4.5% of the total production based on the electricity generation profile (MoEW, 2010).

The 2010 Policy Paper for the Electricity Sector indicates that the share of the hydraulic power production in the electricity mix would be increased by at least 120 MW through “maintenance, rehabilitation and/or replacement of existing hydro plants, and additional capacity”. It also calls for the encouragement of “all individual and private initiatives to produce hydropower, even micro-hydro”.

In this context, MoEW, in collaboration with the French Agency for the Development (AFD) and the consultants Sogreah/Artelia, prepared a Master Plan for the Hydroelectric sector development. This Master Plan investigated the potential of hydroelectric development along all rivers that are entirely within the Lebanese territory and identified 32 new sites with the following potential:

- around 263 MW (1,271 GWh/y) with a cost of \$ 667 million (in run of river scheme)
- around 368 MW (1,363 GWh/y) with a cost of \$ 772 million (in peak scheme)

Of those 32 sites, 25 are economically viable with minimum selling tariff inferior to 12 US\$ cents per kWh, corresponding to the following potential:

- around 233 MW (1,126 GWh/y) with a cost of \$ 560 million (in run of river scheme)
- around 315 MW (1,217 GWh/y) with a cost of \$ 665 million (in peak scheme)

The MoEW also investigated with the World Bank the legal and administrative constraints to the development of a national hydropower market and the elaboration of an action plan for the removal of these constraints. The plan included legal agreements between central government and different stakeholders, and the way hydropower could assist in the 12% RE objective, taking into account the current and projected demand for water in the various sectors.

Within the framework of the road map established by the World Bank for the development of the Hydro sector, and in the light of the renewed agenda of the GoL to underpin the promotion of renewables, it was recommended to launch several steps in the short term to unlock the hydropower potential. The first step is the Communication with stakeholders and the announcement of an EoI procedure for developing new sites. With the current EoI, the GoL discloses its firm intention to support and promote the hydropower sector which potential has not been exploited yet. In this context, this call for EoIs aims at developing specific hydro projects in collaboration with the private sector. The projects that could be selected, as analyzed in the Sogreah/Artelia study, are the following:

Item	Water Stream	Power Plant	Establishment in Charge	Type
1	Abou Moussa	Mechmech	AL BARED	Run of River (ROR)
2	Jhannam + Abou Moussa	Qarn	AL BARED	ROR with STORAGE
3	Abou Moussa	El Mara	AL BARED	ROR with STORAGE
4	Sukkar	Sir	AL BARED	ROR
5	Bared Upper	Sir	AL BARED	ROR with STORAGE
6	Nahr Sir	Qattine	AL BARED	ROR
7	Nahr Sir	El Ouatie	AL BARED	ROR
8	Bared	Bared (Run of River)	AL BARED	ROR
9	Abou Ali	Kannoubin	LA KADISHA - SOCIETE ANONYME D'ELECTRECITE DU LIBAN NORD S.A.L.	ROR with STORAGE
10	Abou Ali	Bchanine	LA KADISHA - SOCIETE ANONYME D'ELECTRECITE DU	ROR

			LIBAN NORD S.A.L.	
11	El Jouz	Beit Chlala		ROR
12	El Jouz	Boustane (Kfar Helda)		ROR
13	El Jouz	Mseilha (Dam)		ROR
14	Ibrahim	Hdaine	SOCIETE PHOENICIENE DES FORCES DE NAHR IBRAHIM DES EAUX ET ELECTRECITE	ROR
15	Ibrahim	Janneh (Run of the River)	SOCIETE PHOENICIENE DES FORCES DE NAHR IBRAHIM DES EAUX ET ELECTRECITE	ROR
16	Ibrahim	Ibrahim 4	SOCIETE PHOENICIENE DES FORCES DE NAHR IBRAHIM DES EAUX ET ELECTRECITE	ROR with STORAGE
17	El Kelb	Chabrouh (Run of the River)		ROR
18	El Kelb	Mayrouba		ROR
19	El Kelb	Boqaata (Run of the River)		ROR
20	El Kelb	Daraya (Run of the River)		ROR
21	El Kelb	Chamra (Run of the River)		ROR
22	Beirut	Dachouniye		ROR
23	Damour	Rechmaya		ROR
24	Damour	Mtaile		ROR
25	Damour	El Boum		ROR
26	Damour	Damour (Dam)		ROR
27	Awali	Jezzine		PEAK
28	Awali	Upstream Joun		ROR
29	Litani	Blat	LITANI WATER AUTHORITY	ROR
30	Litani	Khardaleh (Dam)	LITANI WATER AUTHORITY	ROR
31	Litani	Kfar Sir (Dam)	LITANI WATER	PEAK

			AUTHORITY	
32	Yammouneh	Yammouneh		ROR with STORAGE
15a	Ibrahim	Janneh (Peak)	SOCIETE PHOENICIENE DES FORCES DE NAHR IBRAHIM DES EAUX ET ELECTRECITE	ROR
19a	El Kelb	Boqaata (Peak)		ROR with STORAGE
20a	El Kelb	Daraya (Peak)		PEAK
21a	El Kelb	Chamra (Peak)		PEAK

The above listed Hydro Sites constitute the lot of projects to be launched in partnership with the Private Sector within the following framework:

3. Project Framework

The Ministry of Energy and Water (MoEW) is the main public authority 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 MoEW, is tasked with the management of the sector.

Law 288 (April 2014) further sidelined Law 462 by indicating that, for a period extending two years (i.e., from April 2014 to April 2016), the Council of Ministers (COM), upon joint recommendations from the Ministry of Energy and Water (MEW) and the Ministry of Finance, can license Independent Power Producers (IPPs) pending the implementation of Law 462. Furthermore, the Lebanese Parliament approved law 54 (October 2015) extending the duration of law 288 until April 2018.

The proposed projects in hydro power rely on the application of laws 288 (2014) and 54 (2015) 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 electricity and export electricity to the national grid following the approval of the Council of Ministers and based on the recommendations of the Ministry of Energy and Water (MEW) and the Ministry of Finance.

The launching of this Call for Expression of Interest (EOI) to Participate in Proposal Submissions to Build & Operate Hydroelectric Plants in Lebanon falls within the development of a national sustainable energy strategy and action plan.

4. Instructions to Potential Investors

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:

- The objective of this call for EOI's is for the Government of Lebanon through MoEW, on behalf of EDL, to procure Hydroelectric Energy utilizing a Power Purchase Agreement (PPA).
- The private sector entity will finance, develop, acquire land, design, build, own, operate, and maintain the Hydroelectric plant, and in general be responsible for all other aspects of the operation. The Hydroelectric plant will deliver electricity to the EDL network/grid.
- EDL with approval of MoEW will contract to purchase the electrical energy for a period of 20 years subject to terms and conditions defined in the PPA agreement. MoEW or EDL does not intend to purchase the Hydroelectric plant assets during the 20 years period.
- The contractor will deliver electricity to a location that is mutually agreed to by the contractor and MoEW/EDL. The contractor will build the feeder line, the substation (or upgrade an existing substation) and all other infrastructure required to deliver energy into an existing transmission line.
- The delivered energy will meet the quality standards and requirements adequate for the Lebanese grid condition.
- The contractor will provide real-time energy production, forecasts and related data to EDL's national control center/dispatch center.
- 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 Hydroelectric plant, and other requested information.
- For each Project/Site, the proposed PPAs will be based on the lowest price received from the bidders.

5. Submission of Expression of Interest (EOI)

Submitted EOI's must focus on the following points:

- 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 consortium or joint venture. Each bidder shall provide a statement from each consortium member on behalf of which the lead developer is authorized to act.
- Project description: location with coordinates being displayed on a map, project capacity and estimated generation per year, technical specifications and electric grid integration plans at the proposed location.
- 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 Hydroelectric project.

- 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.

The deadline for submitting the EoI's is June 15, 2018 at 12pm. The location of submittals is the Ministry of Energy and Water, Corniche el Naher, 2nd floor, Minister's office.

6. Application Form

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	
12	Total Proposed Capacity (MW)	
13	Minimum Proposed Generation (MWh/ year) (add attachments if needed)	
14	Availability of an Environmental Impact Assessment (EIA)	
15	Lead Time for Construction (Months)	
16	Lead Time for First Synchronization to the Grid (Months)	
17	Lease Duration (minimum and maximum, in years) (add attachments if needed)	

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