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Assessing EU–Mediterranean Policies in the Field of Energy from a Bottom-up Perspective: The Case of Lebanon

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Abstract

The present report aims to investigate Euro-Mediterranean policies in the energy sector in Lebanon from a bottom-up perspective. The main findings are the following: Lebanon faces enormous challenges such as poor grid quality, shortage in production, important losses, dependency on imports, low development of renewable energy (RE), lack of investment and regular outages. A vigorous policy with massive investments is necessary to address the present situation. The new gas reserves in the Eastern Mediterranean and the potential of RE may indicate some light on the horizon. Considering the challenges, the people's welfare and the local needs, EU policy regarding energy in Lebanon remains timid. It consists mainly of loan facilities, technical assistance and several multilateral projects in which Lebanon participates. Lebanese policy and the support of the EU are consistent, with a market-oriented philosophy, but the role of the state should be reinforced to provide a robust regulatory framework for the market. The EU programmes seem not massive enough to help Lebanon climb out of an energy situation that is hindering its economic development.

1. Methodology

MEDRESET Work Package 6 (WP6) aims to investigate Euro-Mediterranean policies in the field of energy from a bottom-up perspective to deconstruct the theory and practice as well as try to pave the way for a new approach or consolidate what has been done so far. In particular, the research seeks to understand if EU policies in the energy sector in Lebanon respond to people's welfare and local economic needs (e.g., job creation, industrial diversification, effects for local firms vis-à-vis multinational companies, and so on). The methodology used in this report complies with what is proposed in the conceptual and methodological background paper on industry and energy as is defined in section 4 of this document (Moisseron et al. 2017).

The study used a variety of sources: first, the available documents on the energy sector in Lebanon, including academic papers, grey literature, flyers, blogs and so on. But it should be noted that both the academic literature and the grey literature or sources of information on energy in Lebanon remain scarce and limited. A content analysis of these documents was made and used particularly to underline critical or specific concerns. A second important source is the interviews with the identified stakeholders. To this end, a map of relevant stakeholders was

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established, paying attention to ensure a heterogeneous sample, including actors who have been excluded by EU interventions as the Euro-Mediterranean dialogue as well as those with credible claims to "grassroots" representation. We conducted a first round of 17 interviews, (6 by Skype or phone) in January and 11 face-to-face interviews in March 2018. A second round of interviews was carried out in April 2018, consisting of 4 additional interviews to further explore or complement essential issues that appeared in the first round, especially on the political economy of the energy sector and on gender issues, which were not documented in the first round (see Annex 1). Among the interviewees, there were 6 females and 11 males. We encountered some difficulties in organizing the meetings with the stakeholders. It was not always easy to convince the stakeholders to participate, and, except for organizations directly concerned (Ministry of Energy, professional solar organizations, agencies of RE projects, financial organizations in charge of EU funds, and so on), very few were even able to identify EU projects. Despite the lack of response, we succeeded in obtaining a representative sample of the stakeholders in four categories: i) public actors (administration and public bodies – 4 actors); ii) private sector (two companies related to green energy, one professional organization and one financial institution – 4 actors); iii) NGOs (including organizations of women and environment-sensitive associations – 5 actors); iv) academics and think tanks – 1 actor); and v) locally based international agencies – 3 actors). We tried to obtain answers to the central questions of the project and more precisely on the questions raised in the Guidelines for the recursive multi-stakeholder consultations (RMSCs): What issues do local stakeholders deem most relevant? How do they perceive and assess European policy in the region and in their specific policy area? And what are the main policy recommendations? (See Annex 2).

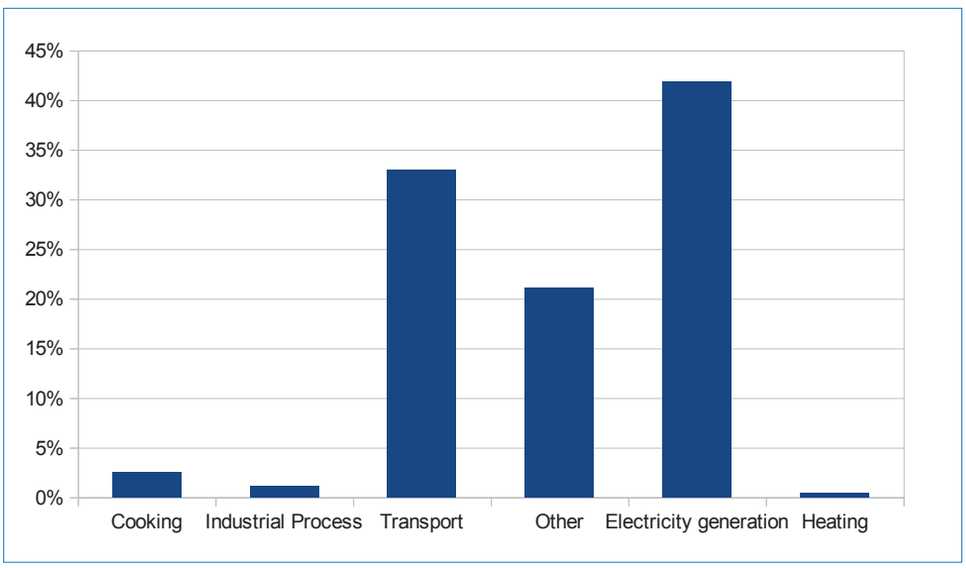
In line with MEDRESET's data management plan, all interviews were anonymous and hence were not recorded, but based on note taking.

2. General Background Analysis of the Energy Sector in Lebanon

Lebanon has faced for many years an important energy deficit, which represents around 20 per cent of the total demand. For example, in 2009, the total energy demand was 15,000 gigawatt/hour although the total produced energy was 11,522 gigawatt/hour (ACTED 2017). More than 95 per cent of the production is based on imports. The Lebanese electric sector is facing problems such as load shedding, losses mainly due to low public investments in the structures and ageing (or destruction) of power plants. A large part of the production of electricity is based on individual diesel generators. These are necessary to overcome the electricity shortages. Oil imports go mainly to the national producer, Electricité du Liban (EDL), and secondly to the local market (both individuals and industry) to fuel the generators. Imports of oil almost doubled in volume between 2006 (4.1 tonnes) and 2014 (7.5 tonnes) (LCEC 2016b: 35). In 2013, less than 9 per cent of the total consumption was locally produced by hydro-electricity (Osseiran 2013: 7).

On the use side, the largest share of consumption is for electricity generation and transport.

Figure 1 | Percentages of the primary energy consumed, 2010



Source: LCEC (2016b: 39).

The industrial sector uses around 25 per cent of Lebanon's energy consumption, while 30 per cent is used by the residential, public and commercial sector and the remaining 45 per cent is used in the transportation sector. The situation is like what it was 20 years ago (Chedid and Chaaban 2003).

The needed investments in the electricity sector are estimated at 6 million US dollars. Lebanon depends mainly on imports to meet its energy needs. In 2010, the government of Lebanon became aware of the critical need to address energy sector issues. It endorsed a Policy Paper for the Energy Sector in June 2010 (Bassil 2010). The paper outlined policies, investments and reforms aimed at increasing the level and quality of electricity supply, managing demand growth, decreasing the average cost of electricity production, increasing revenues and improving sector governance. The paper outlines a set of initiatives that aim at improving service delivery and the reduction of the fiscal burden that the sector places on public resources.

Energy imports include the following types of oil products: liquid gas, gasoline, gas oil, fuel oil, kerosene and asphalt. Total oil imports amounted to 7.5 million tonnes in 2014. In 2010, the baseline for the Second National Energy Efficiency Action Plan (NEEAP) for the period 2016–2020, the total consumption amounted to 6,069,301 tonnes, of which 96.8 per cent was imported, and the remaining 3.2 per cent was locally produced (LCEC 2016b: 37). Table 1 presents a snapshot of key energy indicators from the base year 2010 to the latest available data (2014).

Table 1 | Energy key indicators, 2010–2014

Indicator	2010	2011	2012	2013	2014
Fossil fuel energy consumption (% of total)	94.97296	95.51803	96.36925	95.74186	97.6211
Alternative and nuclear energy (% of total energy use)	1.367077	1.355755	1.487043	1.845227	0.544942
Energy imports, net (% of energy use)	96.75538	96.76062	96.84894	96.47033	97.86554
Renewable energy consumption (% of total final energy consumption)	5.203632	5.161057	4.911935	5.666945	3.203544
Renewable electricity output (% of total electricity output)	5.339868	4.919035	6.792122	7.256819	1.075089
Electricity production from oil sources (% of total)	88.37831	95.08097	93.20788	92.74318	98.92491
Electricity production from natural gas sources (% of total)	6.281823	0	0	0	0
Electric power transmission and distribution losses (% of output)	11.89537	11.4146	9.254013	9.441299	10.4668
Electricity production from hydroelectric sources (% of total)	5.339868	4.919035	6.792122	7.256819	1.075089
Access to electricity (% of population)	99.99955	100	100	100	100

Source: World Bank Data.

It is worth noting that Lebanon has no nuclear energy and has committed not to have any nuclear energy. The imported oil is used as follows: 53.9 per cent for electricity generation, 39.7 per cent for transportation, heating 2.8 per cent, cooking 2.5 per cent, and industry directly consumes 1.1 per cent (LCEC 2016b: 40).

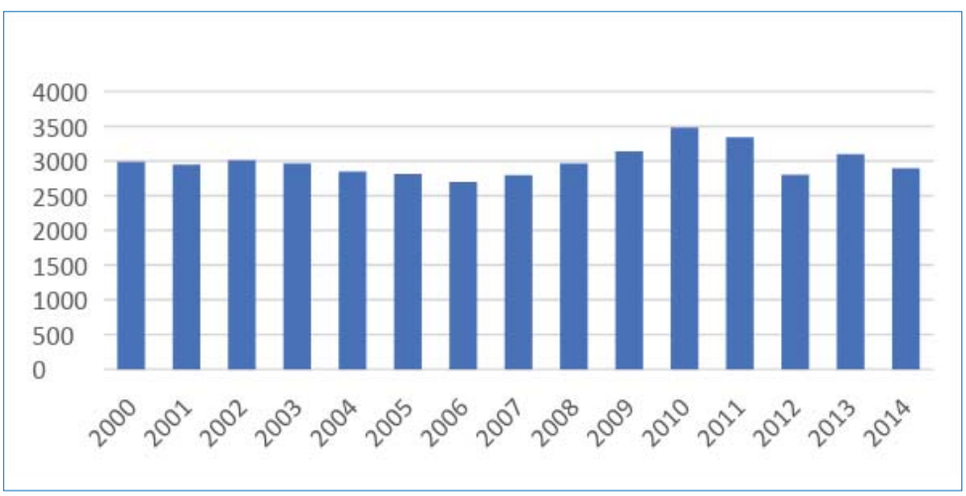
Implementation of the government's reform and investment programmes is underway but is hindered by financial and political obstruction. Lebanon is extremely vulnerable to geopolitical developments and shocks that may increase demand or affect the supply. Moreover, the efficiency of the energy system is below the international standards. The critical situation is due to deterioration of facilities and lack of maintenance. The system suffers from high losses and the transmission network needs to be reinforced. The deteriorating and inadequate infrastructure has led to reduced reliability and insufficient levels of energy supply.

Service delivery standards are low compared to similar countries. Lebanon suffers extensive load shedding. Three-hour supply cuts per day are frequent in Beirut and up to 12 hours per day elsewhere. Most consumers are thus forced to rely on costly and environmentally unfriendly small diesel generators to provide the balance of their electricity needs.

The sector causes a massive drain on the resources of the government, which subsidizes the cost of fuel used in EDL power plants. The sector cost the government around 2.1 billion US dollars in 2016 (Government of Lebanon and UN 2018: 63).

The Syrian crisis and the displacement of a significant number of Syrians to Lebanon have led to more pressure on the demand for energy and a higher cost to the government. To improve access to electricity, there is a need to increase capital investments in generation capacity, transmission and distribution networks, as well as improved institutional capacity and technical assistance. Although the demand has substantially increased, the consumption per capita has decreased slightly in 2014 as shown in Figure 2.

Figure 2 | Electric power consumption (kWh per capita), 2000–2014



Source: World Bank Data, https://data.worldbank.org/indicator/EG.USE.ELEC.KH.PC?locations=LB.

RE is still marginal in the energy mix, but it represents a considerable potential: the primary source of renewable electricity generation in Lebanon is hydropower. Lebanon is a mountainous country. Thus, it has a significant potential for the production of hydro-electricity with both small and significant plants. Lebanon is rich in solar radiation which is estimated at 300 days per year at an annual average irradiance of 4.8 kWh/m2/day (El-Jamal et al. 2014: 176).

As far as employment data are concerned, there is very little information regarding the energy sector in Lebanon. "Labour market data and figures are scant, incomplete, outdated and in some cases contradictory. The most recent data relating to the labour market dates from 2009" (Abou Jaoude 2015: 6). This is particularly true for the energy sector. The labour market is characterized by a large informal sector, which accounts for one third of the GDP. Two third of the workers do not contribute to any social security system, 20 per cent of them are informal employees and 30 per cent are self-employed (Abou Jaoude 2015: 8).

An estimation of jobs directly related to green energy is still very low, as only 500 persons appear to be involved. In 2020, based on a 12 per cent share of renewables in electricity production, the number of workers in the sector is expected to reach is 4,000 (ILO and UNDP 2011: 9).

The oil and gas offshore have an important potential and may create from 3,000 to 5,000 new medium-skilled jobs in excavation, operation and preparation for production in the coming years to meet the projections (Abou Jaoude 2015: 5).

3. General Overview of the Main Challenges and National Policies

Since 2009, Lebanon has implemented sectoral action plans in the oil/gas, water and electricity sectors and elaborated, in 2011, a National Integrated Vision including plans on RE, electricity, oil and gas.

Because Lebanon is mostly dependent on energy, the Lebanese government wants to improve Lebanon's energy security backed by domestic sources. The second priority is to build an environment fostering investment and competition in energy. The third priority is to optimize value out of energy activities for current and future generations. The last point is to promote sustainability and govern the energy sector with transparency and accountability.

Lebanon adopted a first National Energy Efficiency Action Plan (NEEAP) for the period 2011–15 with 14 initiatives (see below) and the second for 2016–2020 (LCEC 2012, 2016). The Ministry of Energy and Water is committed to implementing the strategy, as there is a firm belief that energy efficiency could make a substantial contribution to the supply of affordable energy while reducing the adverse environmental impact. The action plan assumed a demand increasing by 7 per cent annually. It is also expected that the authorities will apply the recommendations of the 2010 Policy Paper (Bassil 2010). The policy paper sets targets to reduce technical losses, to ensure adequate connections and to complete and improve the infrastructure system. It also commits to support and reinforce all public, private and individual initiatives to adopt the utilization of renewable energies to reach 12 per cent of electric and thermal supply by 2020.

The scope of the first NEEAP covers primary energy-saving measures in the generation, transmission and distribution sectors of the Lebanese power network and end-use measures in transport, buildings, industry and agriculture.

The first Plan was evaluated in the second NEEAP with its 14 key initiatives as shown in Table 2.

Table 2 | Results of the evaluation of NEEAP 2011–15

Initiative	Description	Percentage of Completion
1	Towards banning the import of incandescent lamps to Lebanon	45
2	Adoption of Energy Conservation Law and institutionalization of Lebanese Centre for Energy Conservation (LCEC) as the energy agency	40
3	Promotion of decentralized power generation by PV and wind applications	30
4	Solar water heaters for buildings and institutions	53
5	Design/implementation of National Strategy for Efficient and Economic Public Street Lighting	60
6	Electricity generation from wind power	23
7	Electricity generation from solar energy	42
8	Hydro power for electricity generation	34
9	Geothermal, waste to energy, and other technologies	30

10	Building code for Lebanon	0
11	Financing mechanisms and incentives	80
12	Awareness and capacity building	69
13	Paving the way for energy audit and ESCO business	20
14	Promotion of energy efficient equipment	8

Source: LCEC (2016b: 30–31).

This evaluation is in accordance with the evaluation made by the Lebanese Association for Energy Saving and for Environment (ALMEE) (Jouni et al. 2016).

The second action plan has a set of indicators that are monitored as per Table 3 below.

Table 3 | Key indicators for the baseline year 2010 and the target year 2020

No.	Indicator	2010	2020
1	Electric power intensity (GWh/GDP million US dollars) *	0.396	N.A.
2	Gross annual electricity generation (GWh)	15,039	N.A.
3	Imported electric power	1,249	N.A.
4	Exported electric power	0	N.A.
5	Projected growth rate for demand for electric power* (%)	7	5.81
6	Primary energy consumption at the national level (Mtoe)	6.069	N.A.
7	Share of electric power of primary energy consumption (%)	53.9	N.A.
8	The marginal cost of producing one kWh (%)	0.202	N.A.
9	Electrification rate (%)	100	100

Note: * Calculated as an indicator of the quantity of electricity required to generate one unit of GDP.[2]
Source: LCEC (2016b: 44–45).

The expected demand in 2020 would be around 31,344 GWh based on the assumption that demand grows by 7 per cent annually up from its level of 15,934 GWh in 2010 (LCEC 2016b: 47).

Lebanon has included in the second NEEAP the European and the Arab Directives. Among the 14 initiatives of the second NEEAP, seven measures relate to the European National Renewable Energy Action Plan (NREAP) and four to the European NEEAP. More precisely, the following key points were adopted (see details in LCEC 2016b: 50–51):

- Definition of an overall target for the NEEAP and potential savings (GWh/year)
- Definition of the energy efficiency savings by sector
- Cost analysis for each measure
- Methodology of implementation
- Methodology of monitoring
- Definition of quantifiable, specific, achievable and time-bounded targets.

2 "It is the gross annual electricity generation (15,039 GWh in 2010) divided [by] the GDP (as per the World Bank estimation of 38 billion USD in 2010). The electric power intensity for 2010 is therefore calculated as 0.396 GWh/GDP [million US dollars]. Lebanon's low energy intensity can be explained by its diversified and low energy consumption industries and service-oriented economy" (LCEC 2016b: 44).

In 2010, Lebanon also adopted a financial mechanism to boost energy efficiency, namely the National Energy Efficiency and Renewable Energy Action (NEEREA) that allows private sector entities to apply for subsidized loans to finance environmental projects. Loans amount from 2,000 to 20 million US dollars with a low interest rate and repayment period up to 10 years (Jabbour and El-Guindy 2014: 4).

Apart from the NEEAP 2016–2020, the Lebanese government is committed to adopting a national roadmap built on modern environmental concepts (green energy) and counting on renewable energy sources to reach 12 per cent of Lebanon's energy needs by 2020. The key document that addresses the different renewable energy technologies needed is the National Renewable Action Plan for the Republic of Lebanon (NREAP) 2016–2020 that was issued by the Ministry of Energy and Water and the Lebanese Center for Energy Conservation (LCEC 2016a). Lebanon needs to achieve 767 ktoe of energy production from renewable resources to be able to reach the target of 12 per cent (LCEC 2016a: 42–43).

For the future (2017–2030) the new vision of the Lebanese government is to accelerate the fuel sourcing strategy with the development of offshore natural gas in the Mediterranean including the construction of three regasification terminals in Deir Ammar, Selaata and Zahrani. Four pipelines are planned and 2.5 million cubic meters of storage capacity in Tripoli and Zahrani. The ambition is in the long term to replace imports by indigenous natural gas. To complete this strategy of independence, 13 water dams are under construction or have been executed (Abi Khalil 2017: 12–13).

> After years of tensions and delays, the Lebanese authorities agreed in January 2017 on an arrangement dividing the offshore oil and gas blocks along the Lebanese coast on a political, geographical and sectarian basis. The winning bidder of the first licensing round was a consortium of France's Total, Italy's ENI and Russia's Novatek. Their bid was confined to two blocks only, including block 9 in south Lebanon near Israel's Exclusive Economic Zone. (Macaron 2018)

The agreement between the Lebanese government and the consortium was signed in January 2018 and exploration is expected to start mid-2019 and production in 2021. All the above documents include almost no mention of employment and gender issues.

4. Assessment of European Policy Since the Launch of the Barcelona Process

The primary goal of the European Union and Lebanon partnership is Lebanon's development as a stable, democratic, politically open and economically strong neighbour of the EU. The Lebanon Association Agreement has been in force since 2006. The partnership priorities and the EU–Lebanon compact were adopted on 11 November 2016. The EU works mainly through national institutions (ministries, Central Bank, administrative bodies), but a part of the assistance is channelled through civil society organizations. The European Union provides Lebanon with both financial aid and technical assistance.

The European Union has mainly supported the development of renewable energy and energy efficient measures by bilateral EU–Lebanon and multilateral EU–third countries projects. The

financial allocation for EU–Lebanon cooperation for 2014–16 amounted to 147 million euro. Only a small part of the resources (less than 20 million) were allocated for sustainable and transparent management of energy and natural resources (EEAS and European Commission 2014: 7).

4.1 Bilateral Projects

The principal bilateral project was the SMEs Energy Efficiency Instrument (2010–16). This European Neighbourhood and Partnership Instrument was implemented with the Central Bank of Lebanon and Kafalat SAL. The main beneficiaries were Lebanese SMEs and NGOs.

Over the period concerned, the EU gave a grant of 15 million euro. A part of this supported the NEEREA project (financial mechanisms). It consisted of grants equivalent to 15 per cent of the green loan amount for non-subsidized sectors and 5 per cent for subsidized sectors. It provided guarantees for loans to small and medium enterprises. Because of the European grant, the fund could extend the loan duration to 10 years for energy efficient investments, and to 15 years for renewable ones.

Two million euro grants were provided to about 120 small and medium-sized enterprises or non-governmental organizations receiving loans from commercial banks to implement their energy-saving measures. Similarly, a 3-million-euro grant was provided to finance innovative projects with geothermal, biomass and solar technologies.

Another project is CEDRO IV, the Country Energy Efficiency and Renewable Energy Demonstration Project for the Recovery of Lebanon, costing 3 million euro, 2014–16. Implementing partner is the UNDP, while the beneficiaries are the Ministry of Energy and Water, Lebanese municipalities and SMEs. CEDRO IV aims to: (a) increase Lebanon's energy efficiency and promote the use of renewable energy; (b) support the national objective of a 12 per cent share of energy mix from renewable energy sources by 2020 with a 5 per cent increase in energy efficiency; (c) enhance the drive towards a "green economy", creating new green jobs, particularly through engaging the private sector; and (d) contribute to fighting against climate change.

Among the project's initiatives, one is supporting the Lebanese Armed Forces in the development of a sustainable energy strategy under the EU-funded CEDRO IV project, transforming a village in south Lebanon into a low-carbon model village and supporting four municipalities in the implementation of their sustainable energy action plans. The Sustainable Energy Strategy of the Lebanese Armed Forces surveyed many different categories of armed forces buildings across Lebanon and collected baseline information on energy use in 2015. From this baseline, the Lebanese Armed Forces aligned its targets to reduce its greenhouse gas emissions to match those of Lebanon as set in the International Climate Change Agreement in Paris (EEAS 2017).

We may mention bilateral funds with some of the EU member states such as FASEP "Training Development of an Educational and Demonstrative Platform in the field of Renewable Energy in Lebanon", which was funded for 213,138 euro by the Ministry of Economy and Finance between December 2013 and December 2015. Among the implementing partners are the French company Transenergie and the Lebanese Center for Energy Conservation (LCEC, a governmental organization affiliated to the Lebanese Ministry of Energy and Water), with the

support of the Industrial Research Institute (IRI) and the UNDP in Lebanon. The major beneficiary is LCEC. It aims at developing an educational platform to establish training locally, and offering a unique showcase platform to French suppliers of materials for photovoltaic installations.

The EU is also involved in energy networks or events. It regularly participates in the International Beirut Energy Forum organized by LCEC.

The European Union has funded and supported the report issued jointly with UNDP entitled "Lebanon: Derisking Renewable Energy Investment" and published in September 2017 (UNDP 2017). The analysis in the report is built under the umbrella of three projects: (1) the Low Emission Capacity Building project with the Ministry of Environment serving as the national implementing partner and funded by the EU as well as the governments of Australia and Germany; (2) the Small Decentralized Renewable Energy Power Generation project implemented with the Ministry of Energy and Water and the LCEC and funded by the Global Environment Facility; and (3) the EU-funded fourth phase of the CEDRO programme (UNDP 2017: 15).

The EU also supported and contributed to the abovementioned Second National Energy Efficiency Action Plan 2016–2020 (NEEAP) for the Republic of Lebanon.

4.2 Multilateral Projects

The EU also finances Lebanon though several multilateral projects where Lebanon is one of the partners. The EU has made a major push towards raising awareness and building the capacities of Lebanese professionals through the following projects and tools: TAIEX, MED-ENEC, CES-MED, SISSAF, MED TEST, Clima South, MED-DESIRE, SHAAMS, FOSTEr in MED, GR.ENE.CO and SUDEP.

i) GR.ENE.CO, Green Energy for Green Companies, involves Egypt, Italy and Lebanon (1.7 million euro, 2013–15). The project aims to reduce greenhouse gas emissions and to improve energy efficiency by adopting renewable energy and main power resources at the farm level. The project wants to implement several forms of renewable energy: biofuel, biomass, solar, wind and hydro in farms.

ii) FOSTEr in MED, with the purpose of fostering solar technology in the Mediterranean area, involved Italy, Spain, Egypt, Jordanian, Tunisia and Lebanon (IRI) (4 million euro, December 2012–December 2015). The project aimed to exploit the potential of solar technologies through the transfer of technical know-how to sectoral actors (SMEs, engineers, students), the identification of best practices in the policy and regulatory fields and the implementation of five pilot projects aiming to equip public buildings with innovative solar photovoltaic plants.

iii) CES-MED, Cleaner and Energy Saving Mediterranean Cities, started its activities in 2013 and was supposed to last for three years, but was extended twice until April 2018. The project objective is to develop the capacities of local authorities in the ENP-South region to formulate and implement more sustainable local policies, such as those implied by joining the Covenant of Mayors and developing the related sustainable energy action plans (SEAPs). The project outputs for Lebanon are as follows:

1. Two national reports have been prepared jointly with national stakeholders: the "Recommended National Sustainable Urban and Energy Savings Actions" report (Khoury

2015) and the "Donors and Other Funding Initiatives in the Areas of Sustainable Development at the Local Level" report (Khoury 2014).

2. An info toolkit has been elaborated, comprising several manuals to assist local authorities in the preparation of their SEAPs including comprehensive technical guidelines to prepare the plans adapted to the ENPI-South region.
3. Three SEAPs for the municipalities of Beirut, Kab Elias and Baakline have been elaborated. Each city has prescribed specific actions (campaigns, events, promotional publications).

iv) The MED-DESIRE project, Mediterranean Development of Support Schemes for Solar Initiatives and Renewable Energies, was a project co-funded by the European Union through the ENPI CBC MED Programme 2013–15 (4 million euro). The project aimed at spreading energy efficiency, and solar energy across the Mediterranean area through the definition of innovative financial schemes and market stimulation tools. It also aimed to achieve cross-border cooperation and raise public awareness.

v) SHAAMS, Strategic Hubs for the Analysis and Acceleration of the Mediterranean Solar Sector, concerned Spain, Italy, France, Egypt Jordan, Greece and Lebanon (Chamber of Commerce, Industry and Agriculture, Beirut Mount-CCIA-Business Incubation Association of Tripoli, Berytech Foundation) (2.8 million euro, 2012–15). It aimed at raising public awareness on solar energy through the transferability and implementation of good practices in legal, regulatory, economic, organizational issues and financing mechanisms to facilitate the take-up of solar technologies.

vi) MED TEST, financed by the EU up to 8 million euro. The main partner is the Industrial Research Institute (IRI). The programme has benefited 90 companies and organizations (9 in Lebanon) in eight Mediterranean countries since 2014. The programme aims at introducing new good practices in integrated management in industry and energy.

vii) CLIMA South, Support for Climate Change Mitigation and Adaptation in the ENPI South region (2013–17). The programme supports the transition of ENP-South countries towards low carbon development and climate resilience. The CLIMA South project concerns nine south Mediterranean countries: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine and Tunisia. The project was initiated in February 2013 and will be implemented over 48 months with a total budget of 5 million euro provided by the European Union.

viii) The SUDEP South programme (2014–18) is a project funded by the European Commission as part of its assistance to its neighbours in the southern Mediterranean. The direct beneficiaries are 12 local authorities and their partners in the six participating countries (Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia). The project supports the partners enabling them to create their working methodology and implementation models on sustainable energy actions. This is expected to lead to energy savings, energy efficiency and more use of renewable energy sources at the city level. For example, Ardeh project in Lebanon in collaboration with Rene Moawad Foundation has brought to the municipality of Ardeh energy savings of more than 60 per cent. The project includes the proposal of standards for photovoltaic (PV) systems and solar water heaters to the LIBNOR National Solar Energy Committee, the feasibility study for a solar PV testing facility at the IRI, a study tour to Italian solar testing laboratories, training on solar testing and certification, and training of trainers (teachers from public vocational schools), with the aim of ameliorating the quality of installations and equipment.

ix) EU TAIEX is the technical assistance and information exchange instrument of the EU. TAIEX supports public administrations about approximation, application and enforcement of EU legislation as well as facilitating the sharing of EU best practices. TAIEX deals with issues at short notice in three ways: workshops, expert missions and study visits. Lebanon has benefited from this instrument through different TAIEX exchanges with the participation of 120 energy experts. Lebanon is planning to continue benefiting from this instrument to help achieve the targets of its second national energy efficiency action plan (2016–2020).

x) SISSAF Programme, Support Programme for Infrastructure Sector Strategies and Alternative Financing, has provided funding to Lebanon with the aim of promoting green building standards that apply to new buildings or the renovation of old constructions. The project represents an ambitious effort to tackle some critical aspects of the situation in Lebanon directly linked to the economic and social stability of this geographic area. A well-functioning infrastructure in critical sectors like energy, transport and water is a basic precondition for sustainable growth. The budget of SISSAF amounted to 8.1 million euro over the 2013–16 period.

Other EU institutions support Lebanon's energy sector. Lebanon has obtained long-term loans and risk capital facilities from the European Investment Bank, mostly in infrastructure projects. In 2016, the bank confirmed its contribution of an additional 25 million euro to the Green for Growth Fund, to support energy efficiency and renewable energy projects across North Africa, as well as in Jordan, Lebanon and the State of Palestine.

In December 2016, the European Bank for Reconstruction and Development (EBRD) approved a request by Lebanon to become a shareholder of the bank, with a view to becoming a recipient of EBRD investments at a later stage.

In 2013, the EU-funded MED-ENEC (or Energy Efficiency in the Construction Sector) project conducted a study on "A Roadmap for Developing Energy Indicators for Buildings in Lebanon" (Schimschar and al Assad 2013).

5. A Bottom-up Perspective of EU Policy in the Energy Sector

5.1 Analysis of the Documents Produced by Relevant Stakeholders

We did not find critical analyses of the action of the EU in Lebanon or assessment of the EU energy policy in the country. When documents mention the EU, it is mostly in reference to the support of the EU and eventually to express thanks for it. It is thus difficult to address the questions raised by MEDRESET in the analysis of the documents published by the selected stakeholders. We found that the interviews were much more useful in eliciting critical aspects.

The EU seen as a neutral or positive actor for energy in Lebanon

EU projects have been recognized in several events and government publications. The EU supported the third Beirut Energy Forum in 2012. It was cited in the 5th Annual International Beirut Energy Forum which is considered one of the most distinguished energy events in the

region, dedicated to sustainable energy issues. The EU-funded SISSAF project was presented in a special session on aligning donors' efforts for the benefit of the electricity sector. In the eighth annual forum, in 2017, a special session took place entitled "Il Mare Nostrum: Fostering the Euro-Med Cooperation" that focused on the different initiatives of the European Union and ways to nurture active cooperation for the years to come (Chello 2017). CES-MED, SUDEP and CLIMA South projects were also presented on the same occasion.

The EU is explicitly acknowledged for its support to the development of energy efficiency in Lebanon in the Second National Energy Efficiency Action Plan (2016–2020) (LCEC 2016b: 8).

The impact of the Syrian crisis

The first issue mentioned in the government documents taken into account is the consequences of the Syrian tragedy on Lebanon, on all aspects of the daily life including energy challenges. The government of Lebanon has estimated that the country hosts 1.5 million Syrians. To that number one must add 31,000 Palestinians and 35,000 Lebanese returnees. Considering the total Lebanese population of around 6 million, Lebanon has faced one of the worst humanitarian crises. Could we imagine the consequences if the EU had to deal with a flow of 100 million people? Lebanon has shown exceptional hospitality and resilience.

All this population is highly vulnerable as half are children or adolescents. The flows have significantly impacted the Lebanese economy and put additional pressure on unemployment, poverty and local tensions. The International Monetary Fund estimates that Lebanon has incurred losses of 14.4 billion US dollars since 2012 (IMF 2016: 7–8).

To face the situation, the Lebanon government with the assistance of the UN has elaborated a Lebanon Crisis Response Plan (LCRP) 2017–2020 trying to mobilize 2.6 billion US dollars from the international community and the national partners (Government of Lebanon and UN 2018: 5). The plan aims at providing direct humanitarian assistance to 1.9 million people.

The plan includes a chapter on energy. First, the displaced population needs access to energy for their daily life needs. The Ministry of Water and Energy estimates the required increase in the production of electricity at 486 MW (Government of Lebanon and UN 2018: 14).

On the energy chapter, the LCRP objectives are to improve access to electricity regarding quality, quantity and sustainability for all vulnerable populations. A part of the solution is to increase production of electricity both by creating new thermal capacities but also by boosting the use of individual solar installations. A second part of the solution is to reduce demand through more efficient products (indoor LED, energy audits, variable speed drives for pumps, and so on). Then LCRP plans to reinforce the transmission network.

The LCRP mentions gender equality and elimination of gender-based violence (GBV) and wants to comply with the Sustainable Development Goals of the Agenda for Sustainable Development. It recognizes "that gender-based violence (GBV) represents a particular challenge in humanitarian contexts and that preventing and responding to GBV constitutes a collective accountability" and that this will ensure "risk mitigation across all sectors of intervention" (Government of Lebanon and UN 2018: 24).

The role of RE as a new energy narrative

As we noticed, the EU supports mainly RE and energy efficiency, through bilateral and multilateral projects. RE has become a new paradigm and a new narrative for enterprises, NGOs, banks, public organizations and professional organizations. Renewable energies are at the core of justifications for the activities of LCEC, a department of the Ministry of Water and Energy.[3] Professional organizations such as the Lebanese Solar Energy Society (LSES) embed their action in a narrative presented as a "vision".[4] The very active association Green Line aims "To promote environmental awareness and document environmental threat[s] in order to better confront them, thus introducing change at the community level within the concept of sustainable development".[5] The nonprofit organization Lebanese National Energy (LNE) wants to be the "leading change for a better future in Lebanon" and aims

> to boost the Lebanese economy by linking economic, business, and academic leaders [...] to enhance growth and prosperity, create job opportunities, and stop brain drain. This NGO is a platform of communication between the public and the private sectors, looking to make a difference in the national economic scene.[6]

The documents of the private sector, such as solar-system suppliers, use "energy transition" or "climate change" as a marketing argument. For example, the Middle East Green Energy (ME Green) company, established in 2010 in Lebanon, aims "to develop the renewable energy sector in Lebanon and the MENA region with the objective of solving the main problems of the energy and saving the environment".[7]

The documents provided by the selected stakeholders (public actors, NGOs, private sector) available on the Internet insist on the importance of RE as one of the solutions to increase energy supply and to address the structural deficit of production, dealing at the same time with the climate constraints in Lebanon. For ME Green, renewable energies are alternatives to conventional systems. It is true that Lebanon has a vast potential for RE including hydro-electricity, solar energy and wind.

All these examples illustrate the influence of the "RE narrative" in the energy sector in Lebanon.

Energy politics

The energy problems in Lebanon are not only the consequence of destruction due to the war and the conflicts with Israel. They have also become a political problem embedded in the complex Lebanese political dynamics. One of the main problems in Beirut is the uneven access to electricity. But this is far from being only a "technical" problem. To cope, Lebanese households should use private personal generators and even local self-made grids. "They have constituted an infrastructural geography deeply embedded in the everyday, which restructures the urban fabric according to its material, social and political characteristics and produces its own form of politics" (Verdeil 2016: 166). "The intervention's modalities in the trade of generators subscriptions are characterized by a territorial diversity and a variety of

3 See LCEC website: *Who We Are*, http://www.lcec.org.lb/en/LCEC/AboutUs.
4 See LSES website: *About Us*, http://lses-lb.org/about.aspx.
5 See Green Line website: *Mission and Vision*, http://greenline.me.uk/?p=5.
6 See LNE website: *About*, http://lnelebanon.org/#about-agency.
7 See ME Green website: *About*, https://www.me-green.net/about.

territorialised arrangements. Far from being an institutional logic of decentralized regulation of electricity supply, this system sustains the fragmentation of this service" (Gabillet 2010: 153). As Verdeil further states: "The uneven geography of electricity supply in Beirut reproduces existing social and political hierarchies. It favours the city of Beirut and its richer population over that of its suburbs whilst also reinforcing the political and sectarian lines that divide the country" (Verdeil 2016: 157).

Access to electric power has become a political and economic issue. Because of the subsidies from the state budget and the inequalities of access to the public grid, some social groups benefit much more from the subsidies than others. Over the years, the shortages have produced both new infrastructures and new politics with different actors, types of claim and forms of politics, as shown in Table 4.

Table 4 | The various types of grid politics in Lebanon

Cases examined	Type of actors	Type of claims	Form of politics (street/ from within the grid)	Political horizon of the struggle
Burning tyres/mass demonstration	Citizens/ customers	Right to light	Street protest	Sectarian politics
Utility worker's movement	Workers	Right to formal job	Disrupting the grid (+ street protest)	Defence of the national utility
Informal dwellers' hook-ups and meter tampering	Customers	Access to light (not claimed as a right)	Individual quiet encroachment/collective politics of redress using power from within and around the grid	Overcoming and defending local advantages
Regulating neighbourhood generators	Municipality	Access to light (not granted as a right)	Control of the grid	Local politics (often sectarian)

Source: Verdeil (2016: 171).

The situation of Electricité du Liban (EDL) also reflects common characteristics of the Lebanese society. A 2010 study shows that EDL's system suffered from losses which reached 40 per cent: 20 per cent for stolen electricity, 5 per cent for uncollected bills and 15 per cent for technical losses (Bassil 2010: 3, Hasbani 2011: 21). EDL faces many problems, such as difficulties finding candidates to fill positions. But this has also an interesting consequence for political life: "EDL employs around 2000 contractual and daily workers, many of whom are political appointees and unqualified workers" (Bassil 2010: 4, Hasbani 2011: 18). It is true that meter reading may become a dangerous job. EDL employees are regularly subject to physical attacks from the local population if the local communities disagree with energy policy or if they consider that EDL should favour them more in the uneven electricity distribution. The workers of the sector must not be forgotten in the process, because they have a commanding position. In Lebanon as in many countries, the working conditions of the people matter, and any energy reform needs to consider their situation.

This complex nexus explains why reforms are so complicated: "Maintaining of the electricity status quo benefits a restricted circle of intertwined economic and political interests. It prevents

advancing a necessary reform that would improve the electricity service for the benefit of the country's economic growth and citizens' wellbeing" (Hasbani 2011: 28).

To take efficient action, it is vital to understand the importance of local municipalities and communities both in the different projects but also in the political life. For example, the Sustainable Urban Demonstration Energy Project (SUDEP) which was implemented by the Rene Moawad Foundation in the village of Ardeh and its neighbourhoods (local community in the district of Zghorta, north Lebanon) is considered a success story because of the involvement of the communities. The project funded innovative energy-saving measures to help reduce energy expenditure and hence boost the budget of the municipality. The project has optimized energy consumption, led to improvement in the quality of life and strengthened the capacities of local authorities. This example can serve to illustrate that energy reforms and policies should deal not only with the central state but also directly with the local authorities or even with the communities.

5.2 Recursive Multi-Stakeholder Consultations (RMSCs)

One of the main findings of the RMSC analysis is the difficulty for most of the stakeholders to identify and estimate the scope of the EU support to Lebanon regarding the energy sector. This is understandable because a large part of the EU programmes aid the implementation of small projects with the mediation of banks. The visibility of EU initiatives is effective only for those directly concerned, such as government actors. It was thus difficult to collect information about how grassroots actors specifically perceive and assess EU policies in the field of energy.

We therefore focused the interviews on the key ideas/priorities promoted in the field of energy by the stakeholders. This allowed us to give indirect answers to the questions raised by MEDRESET. In the interviews, we also collected information on what the EU should do in the field of energy.

Cost of energy

Most of the stakeholders, and not only the private sector or the users of electricity, insisted on the high cost of energy and the impact of these costs on Lebanese competitiveness (Interviewees 2, 5, 8, 9, 11, 15). An academic respondent mentioned that this cost represents an additional difficulty in exporting Lebanese products (Interviewee 11). The cost of energy is one of the higher in the region. The industrial sector comprises 4,000 factories or companies which account for 14 per cent of the final energy consumption. Energy represents 5.7 per cent of the price of the goods produced in Lebanon. Gains in energy efficiency could lead to a 20 per cent decrease in energy costs (Interviewee 11).

This is a real problem in Lebanon. The main reason, according to a public actor, lies in the inability of EDL to restructure tariffs unless electricity is supplied 24 h/day. If clients suffer a relatively high electric load shortage (5–40 per cent) leading to regular daily outage programmes and unscheduled outages, nothing can be done (Interviewee 15).

According to a respondent from the Ministry of Energy, the EU should help Lebanon to update its electricity grid with a massive plan coordinated with international donors (Interviewee 7).

Lack of data

The public stakeholders, the professional actors and the academic respondent insisted on the lack of information, database and measurement instruments (Interviewees 7, 9, 10, 11). Unavailability of sound statistics was commonly underlined (Interviewees 2, 7, 9, 10, 11). Even for companies wanting to benefit from the banks to improve energy efficiency. It is challenging to have toolkits or experts able to launch the studies (Interviewees 9, 10). As well, professional corporations and academics noticed the weakness of the statistical system on energy in Lebanon. Developing a national database of different sources of energy is necessary. The EU has experience in technical assistance towards the statistical system and may help to implement a national information system on energy (Interviewee 11).

Need for a convenient ecosystem for energy

The private sector and the NGOs stressed ameliorating the legislative and regulatory aspects (Interviewees 9, 10, 12). Even if many improvements have been achieved in the last years, authorities should be more ambitious in the renewable energy sector by creating incentives. According to the professional organizations, the energy sector needs attractive economic laws, innovative financing schemes, public private partnership and independent power producers, as well as general openness of the energy market are essential points for the private sector actors (Interviewee 10). Academics mentioned that Lebanon suffers from a very uncertain and unsafe environment (Interviewee 11). Investors are therefore reluctant to get involved in long-term investment. That is why many stakeholders insist on the importance of financial incentives that increase the propensity for long-term investments (Interviewee 2).

A local community leader pointed out the lack of investments in the grid and in the transmission system (Interviewee 1). A large part of the grid has been destroyed by the civil war, and the conflicts with Israel. The other part is a mix of communities or individual initiatives with a robust informal dimension. The Lebanese grid needs investments, repair and modernization. The terrible shape of the Lebanese grid is one of the explanations for the shortage and power cuts. The EU could launch a massive reconstruction programme financed both by grants and by loans towards the state and the municipalities (Interviewee 5).

The importance of RE for the future

According to a respondent in a public organization, the market-oriented approach seems to be a good strategy in the Lebanese context, but Lebanon lacks big projects such as a solar power plant—as has been done in Morocco for example (Interviewee 10). Public awareness of renewable energy remains very low, and such a big project could increase public interest in the sector, according to a pro-environmentalist association (Interviewee 12). The discussion with the stakeholders showed a favourable view of RE and the role they can play in the future, even if a weak awareness among the population was commonly underlined as well as an "individualist" attitude (Interviewee 10). One of the solutions consists of strengthening RE in the energy mix. But a condition would be to support the construction of local peer-to-peer systems (grid and energy production) based for example in the multiplication of small smart integrated projects, which could be afterwards connected with the central grid. This opinion appears in the interviews (Interviewee 10) and is consistent with the literature (Hajar et al. 2015, Chaaban et al. 2015). According to an academic respondent, the other condition would be the creation of an innovative training ecosystem both in university and technical schools to train students who will have the required technical skills. The assistance of the EU could be useful, if programmes are tailored to fit the local conditions. One of the barriers is still the shortage of

local manufacturers and well-trained technicians (Interviewee 2).

The need for better integration of Lebanon in the Mediterranean and international market

Lebanon used to import electricity from Egypt and Syria. Due to the Syrian turmoil and the destruction in the country, an administrative officer insisted on strengthening the connection of Lebanon with the rest of the world (Interviewee 5). The grid connections with the neighbourhood countries need to be strengthened by the construction of high voltage direct current lines.

For a private sector respondent, the EU has a card to play in that aspect: the term "foreign" is seen as a guaranty of quality for RE suppliers. The fact that products and technology come from Germany or Spain was a positive reference. It is also the case for training programmes or the involvement of foreign experts. This means that the EU has a vital role to play to increase the development of the RE sector in Lebanon by implementing technical assistance (Interviewee 2).

The new capacities of offshore gas production

For most of the respondents, the new capacities of offshore gas production appear to be strategic for Lebanon but also for Europe. This aspect was widespread in the interviews of the stakeholders (Interviewees 2, 5, 8, 13, 16, 17). Eastern Mediterranean gas represents a hope to solve the structural problem of production. It is difficult to assess the real impacts of this new production area based on ground studies (Fattouh and El-Katiri 2015). The discoveries are far from being neutral for future EU policy in the region. A prospective study concludes

> that the East Med pipeline, which has been classified as a project of common interest by the EU, should receive policy priority as its benefits in terms of security of supply go beyond those that can be captured in a competitive market, and the positive externalities that it provides justify a 'security premium'. (Ruble 2017: 341)

As a public actor involved in petroleum, the EU should play a role in the potential conflicts with Israel concerning the Levant Basin reserves (Interviewee 15).

Help Lebanon to reform the political economy of the energy sector

One of the academic respondents (Interviewee 11) insisted on the political aspects, giving the following information. Generators are not all personal, and in many places in Lebanon collective generators are owned by investors, who organize local grid and local production. This is due to the gap between the national supply and the demand as well as the huge shortages. Generator owners have become influential actors and have gained sway over energy policies locally and nationally. There are thus interlinked interests to keep Lebanon's power dysfunctional. The example of the City of Zahle is impressive. The municipal authorities established a company (Electricité de Zahle) which took the concession of the local grid and produced the electricity with a leased diesel generator. With the support of the population, they pushed most of the local generators and their owners out of business. Then they paved the way for the development of individual solar installations with a local net metering contract that allows individuals to sell electricity on the local grid. With a regulated and a safe environment, green energy may replace individual generators (Interviewee 12). The role of the local civil society, the municipalities and the state is crucial to go green.

Greater EU involvement in Lebanon's massive energy challenges

One of the stakeholders summarized the point succinctly: "The EU is far removed from the Lebanese challenges" (Interviewee 12). Lebanon suffers from substantial development challenges due to the lack of security, the regional turmoil, inequality and political instability. A Lebanese estimate states that the cost in 2020 from climate change will be equivalent to 1,500 US dollars per household, so the average cost per household would likely exceed average annual earnings. That many households may fall into poverty (Ministry of Environment et al. 2016: 121). Massive migration of Syrians towards Lebanon is another challenge. The more than 1.5 million refugees registered increased the total population by a third between 2013 and 2015. The consequences are noticeable with added pressure on natural resources, including electricity and water demand. This has in turn increased the use of transport and that of individual generators, resulting in greenhouse gas emissions. These pressures hinder the transition to a low-carbon economy.

5.3 Gender Issues

The cross-issue between gender and energy was not a subject with the two gender NGOs interviewed during the fieldwork. These two NGOs focus on women's participation in economic life and politics, inclusive citizenship and equality. During the discussion, the NGO members acknowledged the relevance of the issue. However, evidence and academic literature contend that gender considerations matter in the energy sector and "that energy interventions can have significant gender benefits which can be realized via careful design and targeting of interventions based on a context-specific understanding of energy scarcity and household decision-making" (Köhlin et al. 2011: vi). This is mainly true in poor rural countries, where wood fuel is still largely used and where the population relies on the traditional use of biomass for cooking and with low access to electricity. This is also true for rural sectors in Lebanon. According to a study conducted by CRTD-A:

> Women represent 34% of the total permanent family workforce in agriculture as unpaid labor. [...] They provide considerable labor to the tobacco crop. They also collect wood for energy and nearly 40% of remote rural areas require women to fetch water from source or wells. Many women are hired to perform seasonal agricultural work, particularly during harvest time, receiving low salaries. (Torres Tailfer 2012: 40)

As a side point, even in a country like Lebanon males and females have different uses and concerns about energy. The behaviours and attitudes, the consumption and the reactions to changing costs or environmental awareness may differ. Moreover, as in many MENA countries, female activity rate in Lebanon stands at 25.6 per cent which is unusually low compared with other countries, whereas the male activity rate reached around 67.8 per cent in 2009. This huge gap between male and female is balanced by a high educational attainment level: 43 per cent of employed women have a university degree (Abou Jaoude 2015: 6).

Even if the gender–energy nexus is obvious, we noticed very low concern for gender issues both in official documents and the discussion with the stakeholders. The gender issue was not present in the different bilateral and multilateral projects. We may, however, find actions of these programmes related to gender and inclusive issues, even if gender was not the central point of the project. An example of gender and inclusive action is provided by the MED-DESIRE project.

Within MED-DESIRE, LCEC organized an awareness-raising event on August 22 and 23, 2015 in collaboration with the Girl Pioneers section of the Scouts du Liban. This event, entitled "Sous un même ciel", consisted of a two-day camp in Tannourine revolving around the conservation of and equal access to resources, including energy. Around 500 girl pioneers participated in distribution of MED-DESIRE awareness-raising brochures and "good deed" actions within the village of Tannourine.

Conclusion

The main findings are the following: concerning energy, Lebanon faces enormous challenges such as poor grid quality, shortage in production, important losses, dependency on imports, low development of renewable energy, lack of investments and regular outages. These structural problems remain in a very difficult period. The government of Lebanon has estimated that the country hosts 1.5 million Syrians. Such flows have significantly impacted the Lebanese economy and put additional pressure on unemployment, poverty and local tensions. They have suddenly increased the need and the demand for energy. Two important perspectives may help Lebanon to find solutions. The new gas reserves in the Eastern Mediterranean and the potential of RE represent new opportunities to deal with the energy challenges in Lebanon. But another point appeared both in the documentation of the stakeholders and in the interviews, concerning the political economy of energy in Lebanon. Many actors have contradictory interests, which can hinder progress in the reforms of the sector. The political situation and the role of the different communities must be considered by EU policy.

Considering the challenges, the people's welfare and the local needs, the EU policy regarding energy in Lebanon remains limited. It consists mainly of loan facilities, technical assistance and several multilateral projects in which Lebanon participates. The EU programmes seem not massive enough to help Lebanon make its way out of a situation that is hindering its economic development. For some of the stakeholders, the action and the policy of the EU do not come close to the huge need for reform and assistance.

The major policy recommendations of the stakeholders are the following:

i) The EU energy policy in Lebanon is too timid to have a real impact, and the EU should increase its level of involvement with grants, expertise and investments

ii) The EU should give assistance in the field of collecting statistics concerning energy.

iii) The EU should help Lebanon to reform the political economy of the energy sector, being aware of the complexity of the sector and of the political links and interests of the stakeholders.

iv) The EU should help Lebanon to take advantage of the new offshore gas exploitation.

v) The EU should support a better integration of Lebanon in the Mediterranean and international market.

vi) The EU should try to involve local communities and municipalities in its policy actions.

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Annex 1: List of Interviews

First Round of Interviews (January and March 2018, by Jean-Yves Moisseron)

Interviewee 1. Private sector, male representative, 15 January 2018, by phone

Interviewee 2. Private sector, male representative, 16 January 2018, by Skype

Interviewee 3. NGO, female representative, 16 January 2018, by phone

Interviewee 4. NGO, male representative, 17 January 2018, by phone

Interviewee 5. Public sector, male representative, 19 January 2018, by Skype

Interviewee 6. NGO, male representative, 19 January 2018, by Skype

Interviewee 7. Public sector, female representative, 19 March 2018, Beirut

Interviewee 8. NGO, female representative, 19 March 2018, Beirut

Interviewee 9. Private sector, male representative, 19 March 2018, Beirut

Interviewee 10. Private sector, male representative, 19 March 2018, Beirut

Interviewee 11. Research centre, male representative, 20 March 2018, Beirut

Interviewee 12. NGO, male representative, 20 March 2018, Beirut

Interviewee 13. International agency, male representative, 20 March 2018, Beirut

Interviewee 14. International agency, female representative, 20 March 2018, Beirut

Interviewee 15. Public sector, male representative, 21 March 2018, Beirut

Interviewee 16. Public sector, female representative, 21 March 2018, Beirut

Interviewee 17. International agency, female representative, 21 March 2018, Beirut

Second Round of Interview (phone, April 2018, by Jean-Yves Moisseron)

Interviewee 3. NGO, female representative, 4 April 2018

Interviewee 8. NGO, female representative, 4 April 2018

Interviewee 11. Research centre, male representative, 4 April 2018

Interviewee 13. International agency, male representative, 5 April 2018

Annex 2: Questionnaire

1) From your point of view, what are the main challenges and/or policy issues concerning Industry and Energy in the Mediterranean?

2) How does the EU respond to these policy issues? How do you personally evaluate these EU policies? How should they be improved?

3) Concerning Energy, which policies implemented by external actors do you believe are significant in the region? Are they converging, competing, or conflicting with those of the EU?

4) Regarding the evaluation of EU policies, do you think they are visible and that "visibility" is an important issue?

5) What is your opinion about the EU procedures and instruments? How could the access of the stakeholders to EU programmes and funds be facilitated?

6) What is your opinion about the Mediterranean solar plan? What lessons can be learned on today's work by the EU and its member states in the energy sector in the Mediterranean?

7) Do you believe the EU should support a South-South cooperation now?

8) How could the EU could take into account the post-Arab 2011 turmoil context?

9) The discovery of offshore gas field in the Levant can be an opportunity for the neighbour countries (Israel, Lebanon, Cyprus) but could it also be a source of conflicts and instability? How could Europe help to secure the production and the exploitation of the zone?
10) In what terms do you see the participation of the Civil Society in the energy sector? How could the EU increase its participation in the partner countries?

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