ELECTRICTY SECTOR REFORM NOTES

1- Electricity Sector Background

- The electricity sector has a **dual impact on Lebanon's fiscal and current account positions**:
  - On the fiscal side, since the fiscal balance has been in deficit since 1992, Electricite Du Liban "EDL" deficits have been financed by public debt. As at end 2018 and since 1992, EDL transfers have reached $40 billion on a cumulative basis, accounting for 45% of the country's public debt (including accrued interest at 6.8%). EDL transfers peaked at $2.2bn in 2012; and closed at $1.8bn in 2018 accounting for 31% of the government deficit.
  - In addition, the sector is highly depended on import of fuel oil and diesel, adding to the country's current account deficit.
- **Supply is insufficient to meet demand** with a shortage of 1.45GW.
  - Peak demand is estimated at 3.45GW in 2018, while net supply from installed and rented power generation reached 2GW. Peak demand was further exacerbated by the influx of Syrian refugees, which have added ~486MW of demand (according to UNDP study).
  - The balance of demand is currently being filled with diesel-fired private generators that are connected to the distribution low-voltage network and charging on average a regulated tariff (since November 2018) of ~$28cents/kwh.
- **Cost of electricity generation is high averaging at $15 cents/kwh** (excluding losses and EDL operating/capex costs) due to usage of expensive diesel and fuel oil to power the generation fleet, although 77% of EDL's generation assets (including the rented barges) can use natural gas
- **High losses in transmission and distribution** (amounting to 34% in 2018) add to the cost of electricity. Losses are split between technical losses of 17% and non-technical loses 21% (theft and uncollected)
  - Taking into account those losses, the cost of electricity is estimated at $20cents/kwh for every kwh sold
- In comparison, **EDL's tariff remains unchanged when it was set in 1994 at $9.5 cent/kwh** covering only 45% of the operating costs.
  - When adding the losses from uncollected, the tariff barely covers a third of EDL's operating costs

2- Electricity Reform Plan

- Lebanon doesn't lack the technical solutions to reform the sector. In fact, numerous versions of reform plans have been put forward since 2008, reviewed and commented on by experts at the World Bank, Mott McDonalds and others.
- Political factors have obstructed progress in the past
- Today, there is a growing recognition that failure to implement the reform plan will risk not only the funding mobilized during CEDRE but also the reputation of the major parties who have pledged to reform the sector (notably the President, Prime Minister, Free Patriotic Party leaders)
- These threats and international pressure are catalysts to implementation of the reform plan
- This has started with **cabinet approval of the Electricity Reform Plan on April 8, 2019 and by parliament on April 17, 2019**
- The approved plan is built around 3 pillars:

1. Pillar 1: **Decreasing technical and non-technical losses** alongside improvement in collection
   - Technical losses: Implement Transmission Masterplan endorsed by cabinet in 2017 to reduce grid bottlenecks and enable energy evacuation
   - Non-technical losses: installation of smart meters with target of 1 million units by 2021
   - Improvement in collection: nationwide campaign to make EDL collection "current"
   - Cost of implementing the immediate reforms: $500 million (Public Sector Funding)
2. Pillar 2: **Increase generation capacity** and reduce fuel cost by **using Natural Gas**
   - Short term solution: Adding 1.45GW of temporary power while the long term power plants are being constructed, filling the supply gap and enabling the increase in tariff
   - Long term solutions: Combined Cycle Power Plants in Zahrani, Selaata and Deir Ammar. Second step would be new power plants in Jeih, Zouk & Hraiche.
   - Natural Gas procurement via the Floating Storage Regasification Units ("FSRU") tender
   - Renewables : heavy renewable energy pipeline to reach 30% renewable energy mix by 2030 (equivalent to 5GW). Renewables enable energy security and independence from oil price fluctuation
3. Pillar 3: **Increase the tariff from $9.5cents/kwh to $14.4cents/kwh** in line with the increase in power generation

Public Sector Funding - Estimated Cost: $500 million

Private Sector Funding - Estimated Cost: $3,500 million

3- Results to Date

Since the implementation of the Plan in April the following has taken place:

- **Pillar 1 – *Public Sector $500m Phase I***
  - **World Bank launched the approval of $500 million** "Program for Results" financing to the ministry of Energy and Water to be disbursed gradually in line with performance improvement. The financing is aimed at enhancing the sector's financial / operational and commercial performance and strengthening EDL's governance and transparency *(Source: World Bank Program Information Document published on April 4, 2019)*
  - **Technical Losses reduction: reducing grid bottlenecks**
    - Mansourieh 2km missing part of the 220KV network **was completed** in mid-June (1-month implementation) despite high political and social pressure over the last 2 decades which have blocked the solution.
      - ✓ **Benefit:** reduction of 1% in technical losses (c. $15 million on 2018 revenues), improvement in stability of the high voltage network enabling connection of future generation assets and improvement in the quality of the electricity
    - Ongoing works in Hermel, Tyre and Feytroun to fix the missing parts of the 66kV voltage network
  - **Non-technical losses reduction**
    - Roll-out of the smart meters by the Distribution Service Providers "DSP" has started in May 2019. Target is to install 1 million smart meters by 2021
    - Nationwide campaign to remove illegal connections
      - ✓ **Benefit:** reduction in non-technical losses which are currently at 21%.
  - **Faster collection** to render EDL's invoices to-date, and arrears collection.
      - ✓ **Benefit**: improvement in EDL deficit for 2019 by c. $185 million (including income from arrears)
- **Pillar 2: Generation and Gas – Private Sector – estimated cost of Phase I $3.5 billion**
  - **227MW Wind farm** set for financial close in September 2019; with OPIC, EIB, FMO and Bank Audi as senior lenders and IFU as mezzanine financiers – transaction is 2x oversubscribed. Tariff is set at $9.6 cents/kwh for twenty years. During the first three years the tariff is set at $10.45 cents/kwh to compensate for the EDL transmission investments required to connect the wind farms to the national grid. The wind farms add 1 hour of clean electricity to all Lebanese at the cheapest cost to EDL (other than hydro).
      - ✓ **Benefit:** the wind farms are the first Independent Power Producer ("IPP") to be financed and executed, providing a "template" and precedent for future transactions. This project is expected to enable all future IPPs, in the renewable and thermal sectors by setting standard bankable documents (including a Power Purchase Agreement "PPA" with recourse on the government) and a PPP model for energy projects to follow.

        $375 million estimated investment, with a $300 million non-recourse project financing package. The investment will have spillover effects on the wider economy. By substituting 100MW worth of power generation from Baalback/Tyre plants (operating costs > $21cents/kwh) to the wind farms, **EDL will be saving $100 million annually.**

- **Preparation of the RFP package of Zahrani and Selaata 1.2 GW Combined Cycle Power Plants with 1.45GW temporary power**, under way by the Ministry of Energy and Water. Prequalification phase to be launched by end of June 2019, RFP by end of August 2019
  - ✓ **Benefit**: These two projects are instrumental and most critical projects, which will cover the electricity supply deficit and enable the increase in tariff. This would then lead to the rebalancing of EDL financial position and a reduction in the cashlow deficit. *Due to the importance of these projects, Bank Audi has donated a $2.3 million Technical Assistance package for this RFP preparation to cover the costs of the technical, financial and legal advisors and the site studies needed to launch the tender. Bank Audi has no advisory role and the selection of all advisors & consultants is made by the Ministry of Energy and Water.*
- **Preparation of RFP for up to 1GW renewable energy projects** (Onshore Wind round II 400MW, Solar with Batteries 300MW, Hydro 300MW) – *Technical Assistance package provided by EBRD for the onshore wind & solar with batteries tenders.*
- **Bid evaluation of 180MW Solar Projects** under way (up to 12 licensees of 15MW each). Expected average tariff around $7-8 cents/kwh (combining all locations)
- **Bid evaluation of the FSRU tender** under way with the assistance of renowned consultant Poten & Partners.
  - ✓ **Benefit**: The procurement of natural gas can be used first to power up to 77% of the existing and rented EDL generation asset, reducing EDL's fuel bill by $400 million. Natural gas will also be used to power the future projects to enable cheap and efficient power plants. Expected procurement of Natural Gas in 2021.

4- Impact of Electricity Sector Reform on Fiscal Deficit

- EDL's deficit in 2018 represented 31% of the budget deficit.
- Assuming all the reform plans are executed as per the plan, most importantly the reduction in losses + Zahrani / Selaata projects + natural gas procurement + increase in tariff, the reduction in EDL's deficit would lead to a substantial improvement in deficit/GDP.
- The below figures show the improvement in EDL deficit over time, should the government execute the Electricity reform plan as presented and approved. This includes notably the following measures:
  - ✓ 2019: most of the reduction in deficit is stemming from faster collections ($185 million) and improvement in losses.
  - ✓ 2020: the improvement stems from the increased tariff once temporary generation is in place
  - ✓ 2021: the sector is gasified
  - ✓ 2022 onwards EDL starts disconnected inefficient and old plants.

Government deficit vs EDL deficit

US$ million	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Government deficit	-4,220	-3,073	-3,952	-4,944	-3,756	-6,246	-4,527				
o/w EDL deficit	-2,027	-2,094	-1,135	-927	-1,328	-1,910	-1,769	-1,231	-876	-195	152
Share of EDL in total deficit	48.0%	68.1%	28.7%	18.8%	35.4%	30.6%	39.1%				
GDP	46,867	48,296	49,974	51,239	53,394	56,271	59,651	62,790	65,930	69,226	72,687
Government deficit/GDP	-9.0%	-6.4%	-7.9%	-9.6%	-7.0%	-11.1%	-7.6%				

Assumptions: 5% GDP growth, 2019 budget measures implemented, Electricity Reform Plan implemented as approved by Government in April 2019.

Important Note: Should there be any delays in implementation, the impacts on EDL deficit will be delayed accordingly. However, the start of the projects' implementation would put Lebanon on the right trajectory to ensure a sustainable trend for government finances, and will have a meaningful impact on deficit / GDP.

5- Q&A

❖ **Why shall we believe that the reform plan will be executed this time?**

- Today, more than ever, there is a growing recognition that the country's fiscal deficit and massive transfers to EDL are unsustainable. Failure to implement reforms will risk the funds pledged in CEDRE, puts the economy at risk of further deterioration and tarnishes the reputation of the political leaders who have pledged to provide 24/7 electricity.
- All of the generation and gas procurement investments are being implemented in the PPP scheme, rendering most of the required investments to be procured by the private sector and international financing and development institutions. We have witnessed today a large interest in investing in Lebanon from the financiers as well as regional and international investors (tested for the wind farms). In addition, the construction, connection and operational risks are also born

by the private sector. Lebanon presents attractive returns for investors when compared to neighboring countries in MENA even when adjusted for the risks.

- Since the government approval of the reform plan in April 2019 we have witnessed **unprecedented measures attesting to the seriousness of the government** in executing the plan; most notably: closing the Mansourieh 220KV missing section in May (after 2 decades of blockage), preparation of RFP for Zahrani/Selaata, faster collection of EDL bills, nationwide campaign to remove illegal connections etc.

❖ **How much of the private sector projects are being funded by multilaterals and development funds?**

- Due to the contracted nature of the IPP cashflows (Take-or-pay revenues, contracted costs on long term basis) the projects can sustain large amount of leverage (75%-80%), making the equity requirement for Phase I of the reform plan estimated at $875m, while the rest is financed with project finance non-recourse debt (c. $2.62bn).
- In addition, the $500 million financing needed by the public sector is in process of being secured by the World Bank - this amount is 50% of the amount pledged in CEDRE by the World Bank to the electricity sector ($1bn out of $4bn total CEDRE World Bank pledge)

❖ **What are the conditionality of the World Bank Facility?**

- The facility needs an official request from the Minister of Finance for first disbursement. Subsequent disbursements are linked on the improvement of performance indicators, which are indicated to be a decrease in total system losses (technical and non-technical), increase in the cost recovery of tariff revenue, rollout of the modernization of EDL.

❖ **What other facilities will be granted to the public sector?**

- Our information is that the EBRD and the World Bank are also considering financing packages to EDL for the transmission network upgrade the Northern loop (EBRD) and Southern Loop (World Bank)

❖ **Who are the potential interested parties in the Lebanon IPPs?**

- The wind farms have gathered high interest from Middle Eastern and European investors. At the end, a French wind developer invested in the farms.
- Multiple Asian, Middle Eastern and European investors have participated in the FSRU & Solar tenders, and responded to the Expression of Interest launched by the Ministry of Energy and Water in 2018 for the Solar with Batteries and the second round of offshore Wind farms.

❖ **What are the main risks to the implementation of the plan?**

- A further deterioration of the economic, political and/or financial situation, which would deter private investment in Lebanon.

❖ **What about the appeal of law 129?**

- A number of members of parliament filed an appeal before the Constitutional Council against Law no. 129 of 30 April 2019 extending the term of Law 288, which allows the Council of Ministers to license private developer to sell electricity to the government under long term contracts. **The**

Constitutional Council rejected the appeal and **confirmed the legality of the extension of the term of Law 288.**

- The council however invalidated an unclear provision of Law no. 129 on the grounds of ambiguity, which states that *the tendering of new projects has to abide by the General* Accounting Law and other ancillary laws related to public procurement, except for the provisions of said laws and the related contracts that are not aligned with the nature of the tender or the underlying contracts […]. The decision of the Constitutional Council pertains to the manner in which future tenders must be run, and has no impact on the validity of the Licenses of the Projects.
- The Ministry of Energy and Water should suggest an amendment of law 129, specifying exactly which provisions of the General Accounting Law shouldn't apply because they contradict with the nature of IPP projects-removing therefore the ambiguity.
- We do not believe this issue will create any big delays in the electricity reform plan.

❖ **What could be the impact of the oil and gas sector on the energy sector?**

- Total, Eni and Novatek will start drilling in maritime Bloc 4 before the end of 2019 and in Bloc 9 in December 2020. Results from the exploration drilling are expected by March 2020. Should Lebanon have proven gas reserves, the extracted gas could be used to power the existing and planned power generation plants, once the gas is extracted in 7-10 years.
- Bloc 4 is very close to the shore and to the Deir Ammar power plant, making the cost of connecting the gas to the shore via a pipeline economically feasible. This would be a game changer for Lebanon and will have a highly positive impact on Lebanon's current account balance as imports of fuel are no longer needed.
- The discovery of gas reserves will also establish substantial wealth for Lebanon in the near future, in commodities that are globally traded (oil and gas). These commodities can have various uses (domestic use/export). There would remain a cashflow issue to be resolved in the short term, that can be easily managed with the electricity reform plan.

❖ **Could Lebanon gasify the energy sector via the Arab Gas Pipeline?**

- Lebanon is connected to the Arab Gas Pipeline which was completed in 2008 and links Egypt and Lebanon through Jordan and Syria, but it was only able to purchase gas from Egypt through this pipeline in 2009 before Egypt's domestic demand absorbed available supplies. While Egypt now has excess gas capacity and is willing to export it to Lebanon, the pipeline infrastructure needs to be tested, given that is has not been used for 10 years. The geopolitical challenges also need to be addressed to facilitate the sale. As such, it is unlikely that Lebanon can exclusively depend on this pipeline for its energy security in the short to medium term.

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