



RESEARCH REPORT

BRIDGING THE BANKING CRISIS TO CROWDFUND ELECTRICITY REFORM IN LEBANON

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List of Acronyms

AUB: American University of Beirut

BDL: Banque du Liban

BOT: Build-operate and Transfer

BSE: Beirut Stock Exchange

CCGT: Combined-Cycle Gas Turbines

Disco: Distribution Company

EDL: Electricité du Liban

EPC: Engineering, Procurement, and Construction

FCY: Foreign Currency

FSRU: Floating Storage Regasification Unit

Genco: Generation Company

GW: gigawatt

IMF: International Monetary Fund

IPP: Independent Power Producer

IPO: Initial Public Offering

KPI: Key Performance Indicators

kWh: Kilo-Watt Hour

LBP: Lebanese Pounds

LV: Low Voltage

MM BTU: Million British thermal unit

MoEW: Ministry of Energy and Water

MV: Medium Voltage

MW: Megawatt

NPV: Net Present Value

O&M: Operation and Maintenance

OEM: Original Equipment
Manufacturer

PEP: Politically Exposed Person

PPA: Power Purchase Agreement

PPP: Private-Public Partnership

PRG: Political Risk Guarantee

UN: United Nations

SDR: Special Drawing Rights

USD: United States Dollars

“

You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”

Buckminster Fuller

Executive Summary

1. Lebanon is facing one of the most severe compounded crises in its modern history that has plunged the economy into a severe recession, causing the complete breakdown of public services and driving the majority of the population below the poverty line.
2. The electricity sector has been a major drain on public sector finances over the last three decades, and despite all the plans and studies to fix the sector, efforts of reform have failed due to continuous political bickering and interference. The sector deficiency has certainly exacerbated the magnitude of the crisis. Accumulated losses over the last 30 years amount to around \$43 billion¹.
3. Today, the sector is in full collapse and proposed solutions to date do not address the long-term sustainability of the sector. Meanwhile, Lebanese are plunged in darkness and rely on expensive and highly polluting private generators to provide their needs in electricity at exorbitant costs averaging 40 \$cent/kWh.
4. Following years of bad public and monetary policies, based on the post-war policy of the peg, the country is also facing a severe financial crisis. Customer deposits in Foreign Currency (FCY) at commercial banks amount to \$107 billion. The banks in turn have accumulated a large exposure to the Central Bank (Banque Du Liban, BDL) in FCY estimated at \$85 billion or 75% of their assets base. The Central Bank losses in FCY are estimated at \$71 billion (excluding gold) which has led to the freezing of deposits. The losses are mostly due to the policy of the peg, public mismanagement, and corruption, which has promoted a consumerist and unproductive economic model.
5. This paper presents an alternative funding model to finance the most crucial electricity reform investments across generation, transmission, and distribution to provide affordable, sustainable, and clean electricity, while allowing the scale up of renewables and the rebalancing of EDL's financials.
6. The funding leverages the banking crisis to offer a crowdfunding mechanism whereby depositors participate on a voluntary basis with their trapped local dollars to the equity capital of two newly incorporated generation companies.
7. The crowdfunding offers an efficient mechanism to improve public participation in national key projects and promote public-private engagement, stimulating not only a constructive relationship, but also a partnership between citizens, communities, and government. This would also help in restoring trust.
8. Over the life of the project, depositors recoup 1.5x their original investment in fresh dollars with quarterly cashflow². Instead of allocating losses, depositors participate in rebuilding Lebanon's electricity sector. The Project is designed to be bankable and profitable, with a Political Risk Guarantee (PRG) from an international multilateral agency.

¹ EDL cumulative transfers source: MOF: <http://www.finance.gov.lb/en-us/Finance/Rep-Pub/DRI-MOF/PFR/EDL> .

² Refer to Part III, 3. Return to Depositors

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9. The companies will be managed by a tier 1 international developer, while the construction, operation and maintenance will be contracted to a tier 1 global Original Equipment Manufacturer (OEM).
10. The Project also includes grid investments and a different distribution model based on decentralized and local distribution companies and the use of pre-paid smart meters.
11. This funding model is in tune with Lebanon's political economy reality. As it doesn't require foreign funding, the proposed solution is resilient to international shocks and allows the Project to be launched imminently following the passing of a Project specific law, complementary with the electricity law 462/2002.
12. The design of the project results in strict governance and transparency standards, which will be imposed by the project specific law, in line with those resulting from the formation of the regulator.
13. While the Project will benefit from macro-economic stabilization that would accompany the conclusion of an IMF program, the model is independent from the conclusion of such negotiations.

Introduction

The lights have gone off in Lebanon. The country is battling one of the most severe financial, economic and political crises in its recent history. The crisis has been in the making for years but came hitting like a hurricane like most crises do. Over the last decades, budget deficits and balance of payments sank deeper into the red lines year-on-year, while successive governments failed to implement basic reforms that would reverse the trend.

The crisis has had catastrophic repercussions on Lebanese citizens, who feel a deep sense of despair. Food, educational, health and financial safety are at risk. People have lost access to their savings due to the banking crisis and access to medicine, electricity, and basic items have become a luxury. According to the UN³, 74% of the population has fallen below the poverty line and the country is witnessing a wide mass exodus wave among its skilled young professionals.

While the financial and technical deficiency of the Lebanese electricity sector is not the major cause of the crisis, it has certainly accelerated its onset. Since 1992, EDL has failed to secure reliable electricity to consumers and to balance its budget. EDL losses averaged \$1.5 billion per year over the last 10 years⁴. This has had ripple effects on economic and social welfare. The lack of reliable and affordable electricity has limited economic growth, constrained efficiency and productivity and while the use of polluting fuels such as Heavy Fuel Oil (HFO) and diesel has large environmental and health repercussions. The financial deficiency of the sector had a dual impact on the fiscal and balance of payment balances. The lack of reforms, transparency and governance have led to a public trust deficit.

Therefore, it comes as no surprise that the reform of the sector is paramount to the sustainability and viability of any restructuring plan. According to the IMF, eliminating electricity subsidies is the “single most important expenditure saving” for the government⁵, and will be an emblematic and major improvement. However, the release of funds by the international community for Lebanon is conditioned on the implementation of a specific list of reforms. For the electricity sector, the appointment of an independent regulator according to electricity law 462/2002 and the implementation of electricity tariffs adjustments are paramount. The electricity reforms are well-known, studied, published, and documented, but remain on paper due to the lack of political will.

Today, the electricity sector is in total collapse. EDL can barely provide 1-3 hours of electricity per day, with chronic blackouts. As a result, consumers are forced to rely on expensive, polluting, and recently unsubsidized diesel generators charging almost 40 \$cent/kwh for their electricity supply.

³ Almost three-quarters of the population living in poverty [Lebanon: Almost three-quarters of the population living in poverty | UN News](#)

⁴ Source Ministry of Finance: <http://www.finance.gov.lb/en-us/Finance/Rep-Pub/DRI-MOF/PFR/EDL>

⁵ IMF staff report for the 2019 article IV consultation. [Lebanon : 2019 Article IV Consultation-Press Release; Staff Report; Informational Annex; and Statement by the Executive Director for Lebanon \(imf.org\)](#)

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The status quo is no longer an option. Breaking the vicious cycle requires the implementation of a comprehensive solution that is consistent with the political economy reality of the country and aims at providing the base to restructure the sector and enable the deployment of renewables. The main impediment to implementing the needed investments and reforms is the availability of funding. The state has limited ability to obtain financing without implementing all the required reforms and there is currently no appetite for private investment given the multiple crises and high-risk environment the country is witnessing.

Given the importance of restoring sustainable and affordable electricity supply for the economic recovery of Lebanon, this paper proposes a comprehensive project across generation, transmission, and distribution, which leverages the banking sector crisis to find a bespoke and local funding solution. The financing is not contingent on foreign financial aid; therefore, the project can be launched imminently. However, the project requires technical, construction, operation, maintenance, and design assistance from international partners.

The aim is to design a project that forces reforms, and acts as a bridge for the full implementation of electricity law 462/2002, while enabling the deployment of renewables.

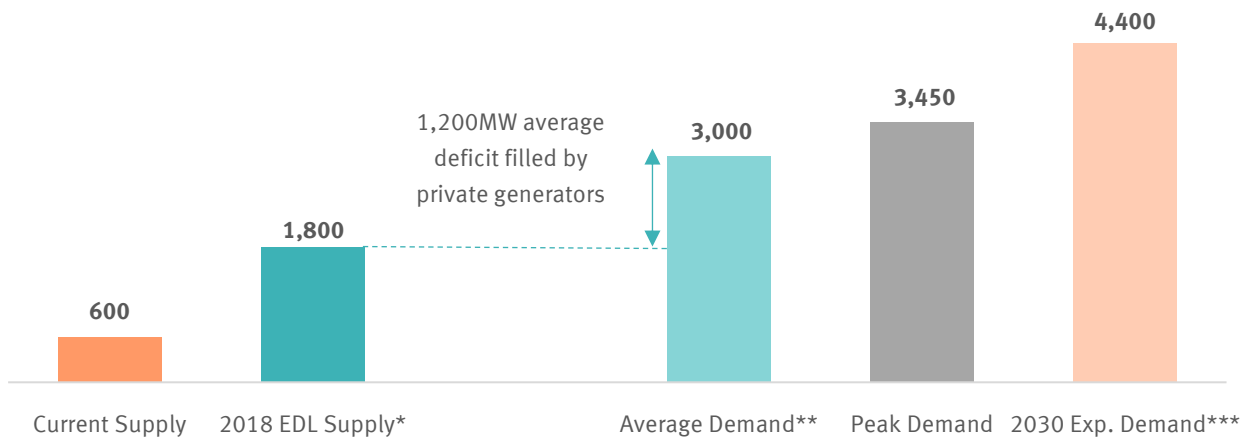
Part I. A Short Review of Lebanon's Electricity Crisis

1. The Lebanese Electricity sector suffers from chronic power

outages, which are being responded to by diesel private generators. Consumers secure part of their electricity from the state through EDL, and an increasingly larger part from expensive and polluting diesel private generators. Therefore, Lebanese are forced to pay two bills to secure their electricity needs: The EDL bill and the private generators bill.

In 2018, average demand was estimated at 3,000 MW while EDL supplied around 1,800 MW. The supply gap of 1,200 MW was being filled by private generators. In 2021, with the lack of fuel supply and maintenance following the shortage of foreign currency, EDL production fell short to 500-600 MW. We expect that demand also dropped in line with the drop in real GDP by around 20% to 2,400 MW, therefore the net supply gap is estimated at 1,800-1900 MW in 2023-2024⁶. By 2030, demand is expected to reach 4,400 MW.

Average demand vs. EDL Net Supply (in MW)



Notes:

*Net Distributed power after accounting for technical losses

**Syrian refugees are estimated by a UNDP study to have increase electricity demand by about 480MW.

*** 2030 Exp. Demand assumes 5% y-o-y demand increase starting 2023.

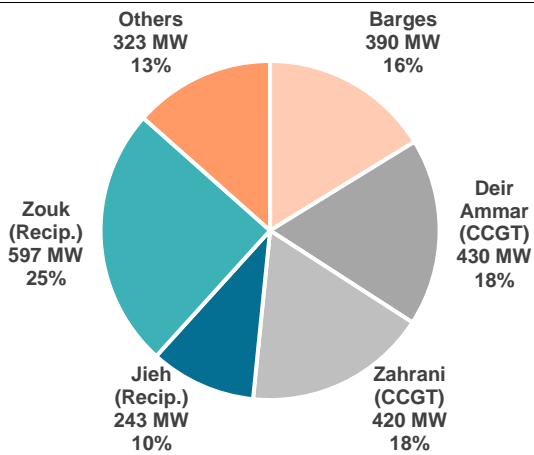
⁶ Refer to Part I. 5. Assessing the generation gap. Net supply gap is net of technical losses.

2. EDL is Financially Unviable

It is suffering from a high cost of production, high technical and non-technical losses coupled with a low fixed tariff in LBP, well below cost recovery. The below analysis focuses on 2018 as a reference year since the performance of EDL wasn't impacted by the current crisis then.

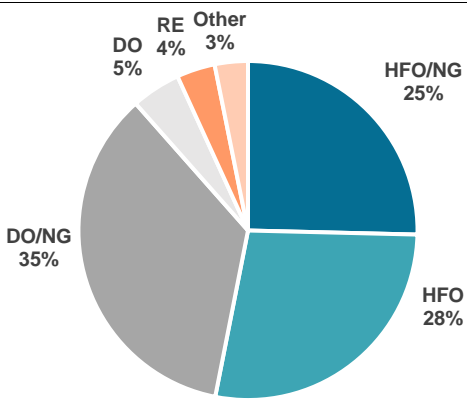
2.a. High cost of production. EDL suffers a high cost of production owing to the use of HFO, which is a highly polluting fuel, and diesel, which is cost inefficient, while 60% of the plants could have been switched to natural gas saving around \$200-300 million per annum in the fuel bill. Average cost of production in 2018 averaged 14.42 \$ cent/kwh⁷. The below figures show EDL's power generation capacity by plant, its fuel mix and the average cost of electricity production per plant for 2018.

Power Generation 2.4GW Net Capacity* FY 2018



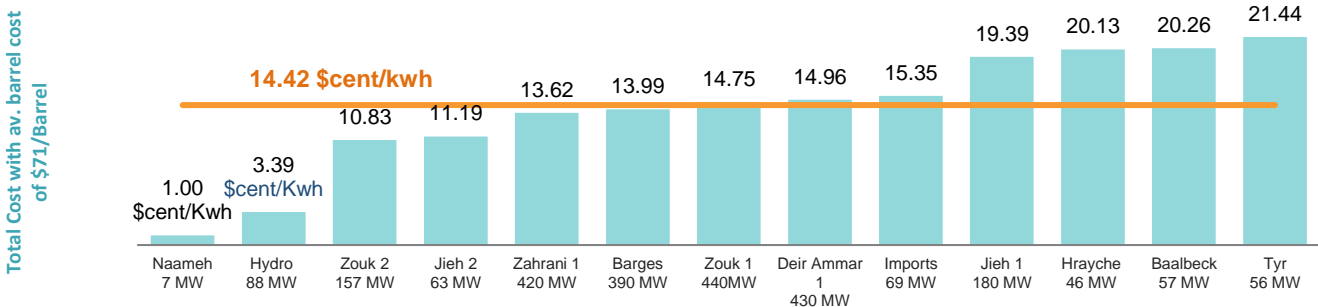
Note: Available generation capacity before technical losses

Fuel Mix: 53% HFO and 40% Diesel, 60% of the fleet can use Natural Gas



HFO: Heavy Fuel Oil, DO: Diesel, NG: Natural Gas, RE: Renewables

2018 Cost of Generation per Plant (\$cent/kwh)



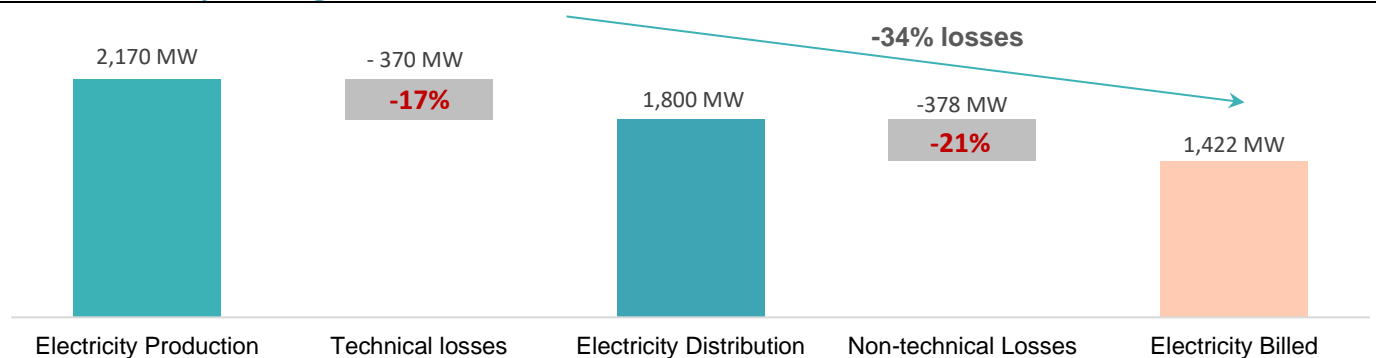
Source: Electricity Reform Plan April 2019

⁷ Source: Electricity reform plan - April 2019: https://www.energyandwater.gov.lb/mediafiles/articles/doc-100515-2019_05_21_04_27_25.pdf

2.b. EDL suffers high technical and non-technical losses. Over the last two decades, there has been a lack of investment in the power infrastructure resulting in old and inefficient assets (in generation, transmission, and distribution). The lack of investment and proper maintenance has resulted in high technical losses in the transmission and distribution networks reaching 17% in 2018. Moreover, there has been a high level of non-technical losses averaging 21% from electricity theft, as well as unpaid and uncollected bills.

Since the onset of the crisis, losses have increased to reach almost 50% with a surge in non-technical losses due to the deterioration in economic conditions.

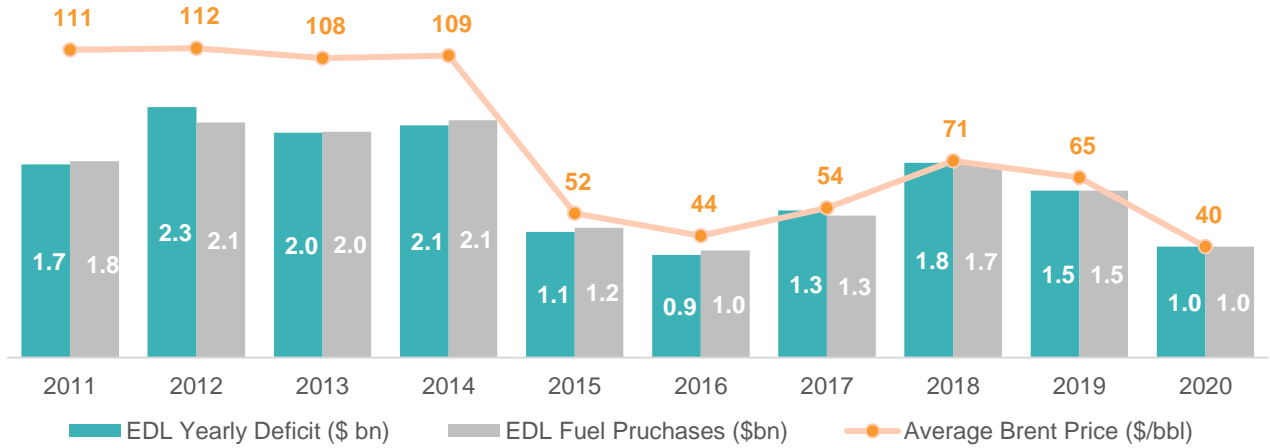
Inefficient Utility with High Losses as at 2018



2.c. Low Fixed Tariff in LBP. EDL's tariff has been unchanged and fixed at 142 LBP/kwh on average since 1994, when the barrel of oil price was below \$20/barrel. That price is equivalent to 9.5 \$cent/kwh at the official rate of 1,500 LBP/USD and 0.7 \$cent/kwh at the current parallel market rate of c. 20,000 LBP/USD. Moreover, EDL is not current on invoices, it has at least over 12 months of arrears and uncollected bills, and in spite of the steep deterioration of the LBP, EDL has not accelerated collections to preserve the counter value of their revenues in foreign currency.

The resulting impact of the above is a utility with high financial losses averaging \$1.5 billion per year over the last 10 years, and exceeding \$2 billion per year during the period 2012-2014 when oil prices exceeded \$100 / barrel.

EDL Historical Yearly Deficit, Fuel Purchases vs. Oil Prices

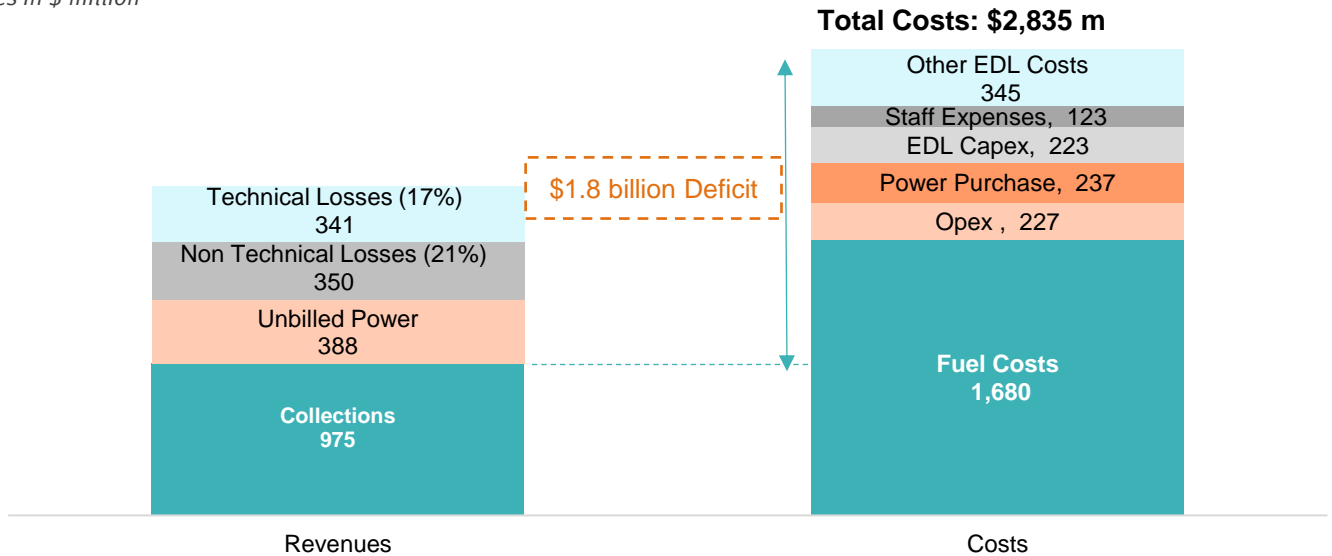


Source: Ministry of Finance

The below shows a breakdown of EDL’s revenues and costs as of 2018. EDL’s cost of electricity includes: operation and maintenance of its power plants, fuel purchases, salaries, power purchases, payment under the DSP contracts, maintenance costs of the grid and other general expenses at EDL level. Historically, EDL relied on the state for fuel purchases while it covered other costs from revenues collection.

2018 Estimated Financial Deficit

Figures in \$ million

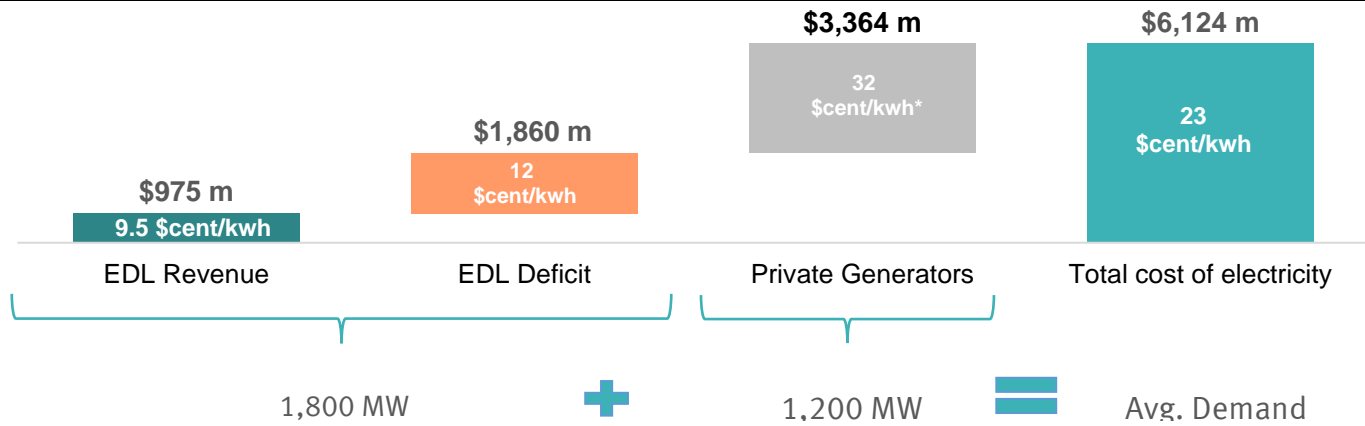


Source: EDL

3. Direct Costs of Electricity Supply to the Lebanese Economy

The direct cost of electricity supply to the economy is the sum of (1) EDL’s cost of production and (2) private generators’ revenues. Given the private generator market is an unregulated parallel market, which doesn’t declare revenues nor pay taxes, it is hard to exactly estimate the total revenues of that sector. The below provides an estimate of the sector revenues based on EDL’s electricity supply gap and estimated private generators’ costs per kwh. In 2018, total cost of electricity supply is estimated at \$6.1 billion and composed of EDL’s costs to supply 1,800 MW at \$2.8 billion and private generators’ costs to supply 1,200 MW at \$3.3 billion. This figure represents 11% of 2018 GDP.

Estimated Total Cost of Electricity on the Economy in 2018

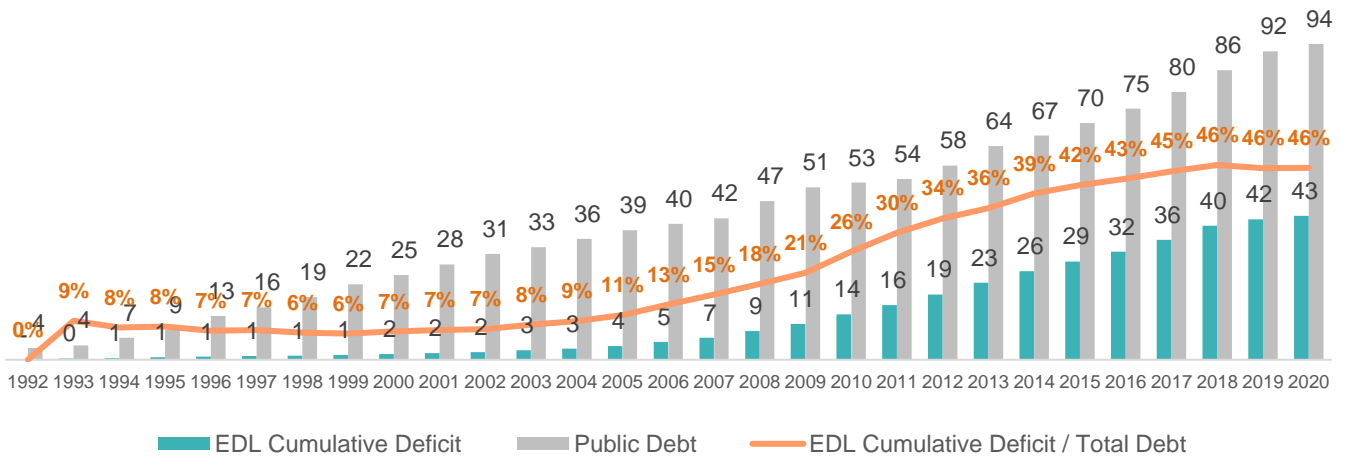


*Private generators costs includes: Diesel cost estimated at 24 \$cent/kwh, O&M at 2 \$cent/kwh, capital costs 6 \$cent/kwh.
 Source: estimates for fiscal year 2018, excluding capital cost of plants and indirect costs (health, environment and economy).

4. Accumulated Costs over the Last 30 Years

EDL has been financially deficient since 1992, and has been relying on advances from the ministry of finance to fund its fuel and other costs in foreign currency. Given that the fiscal budget has been in deficit ever since, those advances in foreign currency were funded by Eurobond issuances or from BDL reserves. The below figure illustrates the cumulative costs of transfers to EDL (\$22 billion) including accrued interest (\$21 billion) over that period, which together sum up to \$43 billion.

EDL cumulative costs on the economy 1992-2020



Source: EDL cumulative transfers source: MOF: <http://www.finance.gov.lb/en-us/Finance/Rep-Pub/DRI-MOF/PFR/EDL> Calculation of cumulative interest cost at an average cost of 6.5%.

5. Assessing the Generation Gap to Provide 24/7 Electricity

Excluding the rented power barges, Lebanon currently has up to 1.9-2 GW of available gross capacity. However, some of the plants need to be decommissioned given that they are highly cost inefficient (old and past their useful life), have high pollution impact, and cannot be switched to natural gas. The plants proposed to be decommissioned with a total gross capacity is 779 MW are shown in the table below, including the type of fuel they use and year of commissioning.

Therefore, the remaining plants have a gross capacity of 1.2 GW or 1 GW net of technical losses. Lebanon needs an additional 2,000 megawatts of new power plants gross capacity to meet average demand over the next 3 years and allow the scale up of renewables (by providing base load power). It is worth noting that net of technical losses of 12%, the distributed power would drop to 1.8GW which is the expected gap in 2024 when the plants are expected to be online.

	Actual		Forecast					
	2018	2019	2020	2021	2022	2023	2024	2025
Electricity Demand (MW)	3,000	2,740	2,503	2,427	2,549	2,676	2,810	2,951
Electricity Demand (% change)		-9%	-9%	-3%	5%	5%	5%	5%
Real GDP (% change yoy)		-7%	-20%	-10%	0%	5%	5%	5%
EDL Generation (MW)	1,800	1,800	1,400	600	1,000	1,000	1,000	1,000
Gap (MW)	1,200	940	1,103	1,827	1,549	1,676	1,810	1,951

The number and location of plants should follow a least cost generation study to locate the most cost and time efficient solution. Some of the advantages of building the new capacity in Zahrani and Deir Ammar is the availability of land, grid connection and fuel infrastructure. This will save time and costs. Locating these new plants next to the existing ones would also avoid changing the nature of the surrounding area.

Existing plants to remain in use and new capacity

Plant	MW	Fuel Type	Year
<i>Existing Plants</i>			
Deir Ammar I	430	NG/DO	1998
Zahrani I	420	NG/DO	1998
Zouk 2	157	HFO/NG	2017
Jieh 2	63	HFO/NG	2017
Hydro	88		
Naameh	7		
Total Existing Capacity	1,165		
<i>New Plants</i>			
Zahrani II	1,000	NG/DO	2024
Deir Ammar II	1,000	NG/DO	2024
Total New Capacity	2,000		
Total Capacity	3,165		
Net Capacity ('-12% technical losses)	2,785		

Plants to be decommissioned

Decommissioned Plants	MW	Fuel Type	Year
Zouk I	440	HFO	1985
Jieh 1	180	HFO	1970
Hraycheh	46	DO	1983
Baalbeck	57	DO	1996
Tyre	56	DO	1996
Total Decommissioned Plants	779		

Note: the Deir Ammar I and Zahrani I combined cycle power plants commissioned in 1998 were upgraded several times, which allows them to still be efficient and in good condition.

Part II. Estimated Losses of the Lebanese Banking Sector.

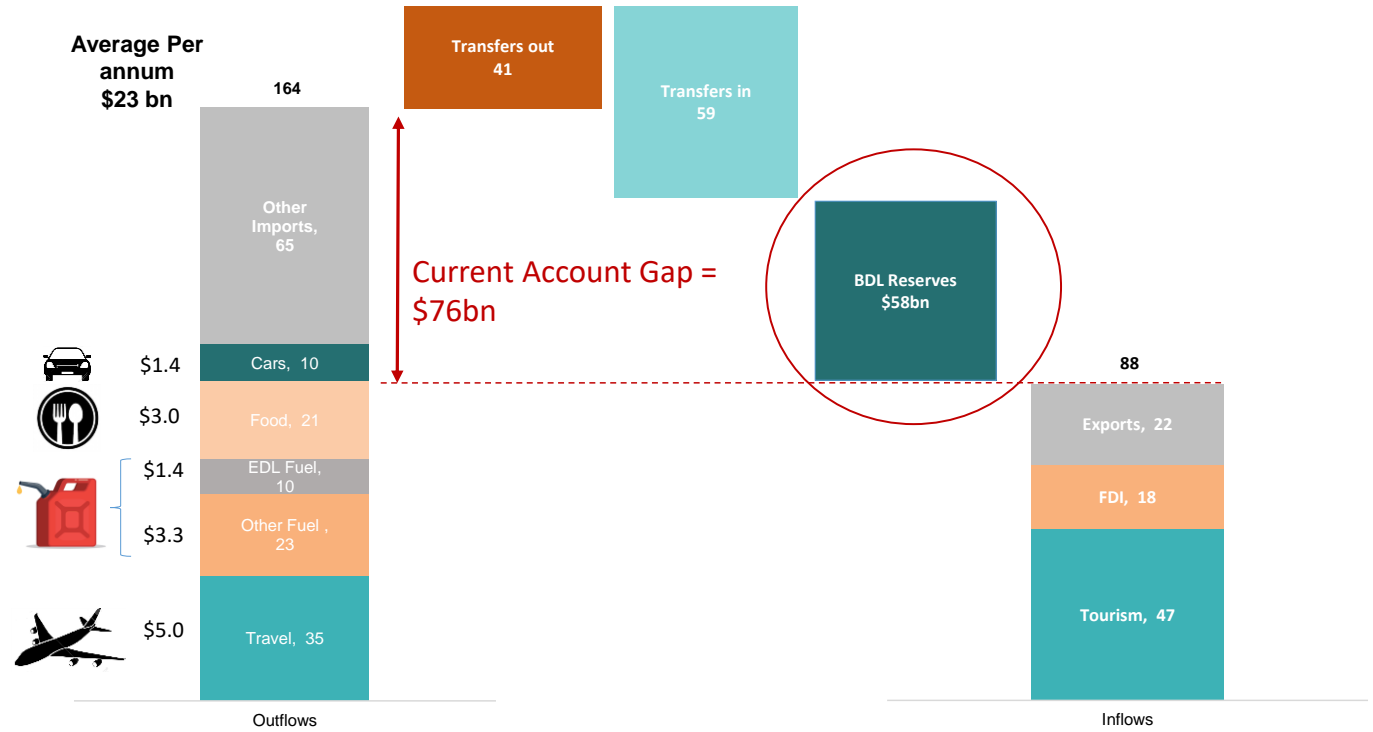
Lebanon's current financial crisis is a manifestation of the failure of the country's economic model since the post-civil war era. The model was based on the policy of the currency peg at 1,500 LBP/USD, which has encouraged consumerism and lack of investment in productive sectors. In fact, the World Competitiveness Report, which was issued in 2019 by the World Economic Forum⁸, classified Lebanon as one of the least competitive countries. Moreover, the high cost of electricity inhibited investments in productive sectors.

Against all odds and predictions, the economic model was sustained over 25 years by capital inflows, which became an essential feature to maintain an otherwise indefensible peg. The political economy result of the model was the creation of large ties between the commercial banks and the public sector; the banks were an essential part of the equation to keep on attracting the much-needed funds to sustain the peg. In addition to these capital inflows, came international bailouts of Paris II (2002) and Paris III (2007) to boost BDL reserves in times of need and avoid a currency and debt crisis. The international financial crisis of 2007-2008 also brought large capital inflows during the period of 2009-2010, as the Lebanese banking sector was commended for not having any exposure to the US subprime market.

However, the trend and international community willingness for unconditional bailouts reversed starting 2011. With the start of the Syrian civil war and the political tensions in Lebanon, investor confidence began to fade, and the country continued leaking foreign reserves. Over the period 2014- 2020, it is estimated that around \$58 billion of foreign reserves at BDL were used to fund a growing current account gap estimated at \$76 billion driven by the policy of the peg.

⁸ Available here: https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

Unsustainable Economic Model 2014-2020



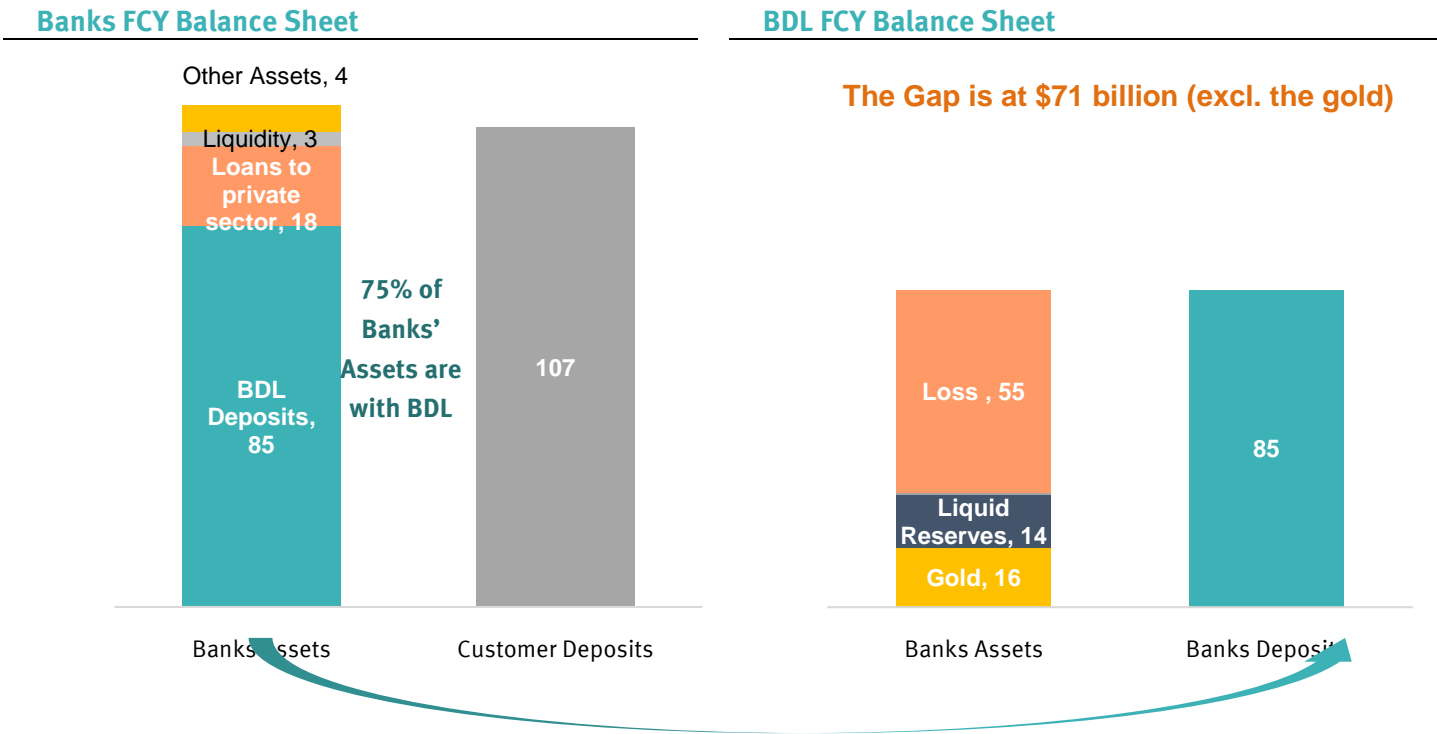
Source: Lebanese customs

Despite the accumulation of a high level of losses, which started in 2014, the government maintained the same monetary and fiscal policies. BDL continued to increase interest rates to attract as much foreign funds as possible. In 2019, levels became unmanageable and the financial crisis began.

As of September 2021, BDL losses are estimated at \$71 billion (excluding the gold) and \$55 billion, including the gold. However, given that the gold cannot be used to offset these losses, the gap to cover stands at \$71 billion. Additionally, as of this date, the banks FCY deposits are estimated at \$107 billion. This has resulted in freezing customers’ deposits at banks and de-facto capital controls. A sustainable resolution of the banking crisis will certainly require a solution to cover the \$71 billion FCY gap at BDL. As of October 2021, FCY deposits are priced in the market at less than 20 \$cent to the dollar.

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The below figure depicts the high-level balance sheets of the commercial banks and BDL in FCY, showing the large exposure of the banks to BDL and the amount of losses.



Note: Other assets includes Eurobonds net of ECL and investments

Part III. The Solution: Bridging the Electricity and Banking Crises

1. The Goal

The goal of any electricity reform plan should be to provide the **cheapest, cleanest, and most sustainable electricity supply** to all the Lebanese.

For that goal to become a reality there is no question that the sector strategy needs to maximize renewable energy production. The energy market has witnessed a revolution in recent years. As of 2020, the cost of renewable energy technologies, has dropped multiple folds, making renewable energy, and mainly solar and wind, more competitive than any other fossil fuel based source of electricity. In fact, the cost of solar panels has dropped by 85% over the last 10 years⁹. The deployment of renewables also brings multiple benefits: Job creation, reduction of local air pollution, as well as our consumption of fossil fuels. This would

⁹ According to IRENA 2020 Renewable Power Generation Costs available on: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Jun/IRENA_Power_Generation_Costs_2020.pdf

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help insulate our economy from external energy shocks and reduce our balance of payment deficit by reducing our imports of fossil fuels – a core and central cause of our current demise. Since renewable energy is mostly located in rural areas, these investments stimulate rural development.

However, the barriers to the uptake of renewables in Lebanon are numerous. The most important being the status of the grid, the lack of base load¹⁰ electricity subsidized electricity and financial viability of EDL.

2. A Comprehensive Solution

The Project aims at resolving the above barriers by presenting a reform-enabling and comprehensive solution for the electricity sector across generation, transmission and distribution, for an estimated cost of \$2 billion.

The main impediment for projects implementation is the availability of funding, especially for the generation, which represents 80% of the project costs:

- 1- The state has limited ability to obtain new funding without deep reforms and an IMF program;
- 2- No appetite for private investment given multiple crisis and high-risk environment.

Given the importance of the project for the economic recovery of Lebanon and the livelihood of its citizens, this paper proposes a different funding model that is more consistent with the nature of the Lebanese political economy. While the funding doesn't follow the standard financing model, it aims to achieve the same results. It does not impose additional borrowing on the government.

The financial structure leverages the banking crisis to propose a bespoke financing solution, which is not contingent on foreign financial aid; therefore, it is resilient to international shocks and can be launched imminently following the passing of a project specific law. However, it requires technical, construction, operation, maintenance and design assistance from international partners.

It is worth noting that even if there was political will to implement all the required reforms in addition to an IMF program, fulfilling the needed requirements will certainly impose long lead-time and delayed project launch/completion. This has serious implications on the country's FCY reserves and balance of payments due to the expensive imports of diesel to power the private generators.

The proposal offers depositors, on a voluntary basis, the opportunity to fund with local dollars and own the new power plants based on a BOT scheme over 20 years via an Initial Public Offering¹¹ (IPO) on the Beirut

¹⁰ Base load electricity is the minimum amount of electric power that needs to be constantly supplied to the grid all year long to stabilize it and allow the connection of large amounts of renewable energy, which is intermittent in nature. One of the most efficient types of base load electricity are gas-fired combined cycle power plants "CCGT plants".

¹¹ An initial public offering (IPO) refers to the process of offering shares of a private company to the public in a new stock issuance. An IPO allows a company to raise capital from public investors.

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Stock Exchange. In return, depositors will recoup 1.5x their initial capital in fresh dollars over the lifetime of the project.

Since the Central Bank's remaining reserves were accumulated from banks' deposits at BDL (hence depositors money), the basic premise of the proposal is that BDL releases up to \$1.6 billion of its remaining reserves, (which currently stand at \$14 billion, as announced) in exchange for depositors \$4.8 billion local dollars (proposed ratio of 3x, compared to current market rate of 5x for local dollars/fresh dollars). Therefore, BDL FCY gap shrinks by \$3.2 billion as assets drop by \$1.6 billion while liabilities drop by \$4.8 billion.

EDL's cost of electricity production/purchase will drop from 14.4 \$cent/kwh to 10.3 \$cent/kwh on average, and private generators will be eliminated, reducing the cost of electricity to consumers from 23 \$cent/kwh (prior to the crisis) to 15 \$cent/kwh, saving \$2 billion annually to the Lebanese economy¹². Therefore, the daily cost of delaying the implementation of the project is \$5.5 million.

Total FCY deposits in the banking sector stand at \$107 billion, therefore the needed capital raise represents around 5% of the deposit base. According to World Bank statistics, 49.3% of the adult population in Lebanon held deposits in the local banking sector in 2020¹³, hence, the project allows a wide participation from all classes of society.

All the project agreements will be structured to be bankable as per international standards to allow for the leveraging or sale of the companies to international developers once macro-economic stabilization is achieved, this could provide for an early exit to depositors.

The Project also includes (1) the upgrade of the grid to reduce technical losses, (2) tariff reform and the switch to pre-paid smart meters, (3) a new distribution model based on decentralized model and (4) a new governance model.

¹² Refer to Part III. 4. Cost of Electricity

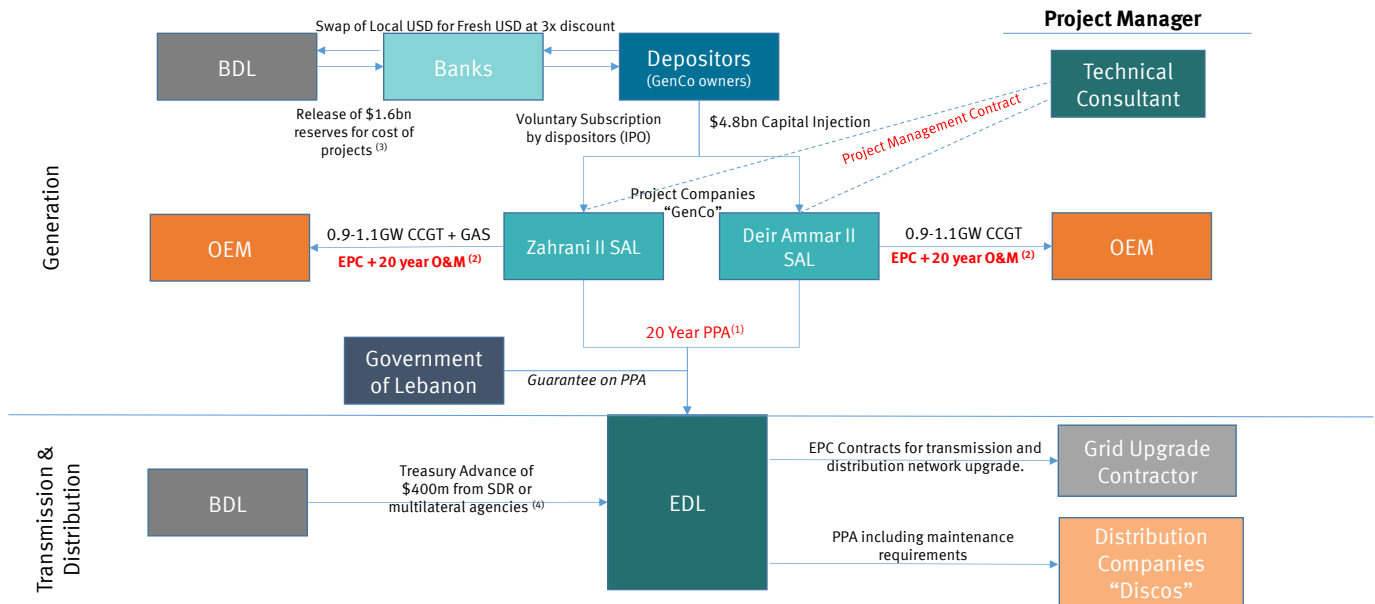
¹³ <https://data.worldbank.org/indicator/FB.CBK.DPTR.P3?locations=LB>

Summary Project Details

	Generation	Grid Investment	Distribution
Ownership	New Private companies: Deir Ammar II SAL and Zahrani II SAL, together the “Gencos”, owned by depositors and managed by International Project Manager under BOT scheme	EDL	Private Distribution Companies, the “Discos” under PPP scheme
Details	<ul style="list-style-type: none"> ▪ Construct two power plants with a capacity of 2GW: <ul style="list-style-type: none"> – Zahrani 2: 0.9GW - 1.1 GW Gas to Power CCGT – Deir Ammar 2: 0.9GW- 1.1 GW CCGT ▪ Gencos to enter into: <ul style="list-style-type: none"> – Management agreement with a Tier 1 global developer; – EPC and 20 year O&M with a Tier 1 manufacturer; – PPA with EDL guaranteed the Lebanese government with PRG from a multilateral institution <p>Project integrates the plan to import natural gas from Egypt to Deir Ammar via the Arab Gas Pipeline, therefore an FSRU is proposed in Zahrani.</p>	<ul style="list-style-type: none"> ▪ Transmission: Upgrade the network as per EDL master transmission plan of 2017 to reduce technical losses and allow the connection of the new generation assets. ▪ Distribution: Install prepaid smart meters, fix the national control center (NCC), upgrade low/medium voltage networks 	<ul style="list-style-type: none"> ▪ Decentralized private companies to take on the duties of billing, collection, and MV/LV maintenance. ▪ They will be granted by law the power to disconnect non-payers. Issue e-billing and sell prepaid cards. ▪ Discos to enter into a PPA with EDL to purchase electricity and on-sell it to consumers based on prepaid cards.
Cost	\$1,600 million	\$400-500 million	N/A
Proposed Source of Funding	Depositors via BDL reserves	SDR or Multilateral Institutions	Technical Assistance from Multilateral Institutions

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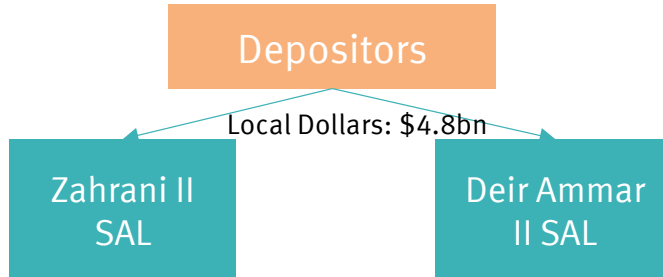
High level Schematic Overview of the Project



- (1) New Project Companies to enter into a "construction + 20-year" PPA with EDL, land rent agreement and network connection agreement guaranteed by the Government of Lebanon "GoL", with political risk guarantee from Multilateral Institutions.
- (2) Each Project Company to enter into an EPC + 20 years Operation and Maintenance Agreement with a top tier Original Equipment Manufacturer "OEM" for the construction of 0.9 GW - 1.1 GW Combined Cycle Power Plant "CCGT" in each site. Zahrani to also include natural gas procurement via an FSRU.
- (3) Depositors participate in the IPO of two generation companies "GENCO" with local dollars. BDL to swap the Genco local dollars for fresh dollars to fund the EPC contract. Deposits recover 150% of their capital in fresh dollars over 20 years.
- (4) Treasury Advance of \$400m from SDR or Multilateral funding to upgrade the transmission & distribution networks + install prepaid smart meters.

2.a. The Generation Model and Financing Structure

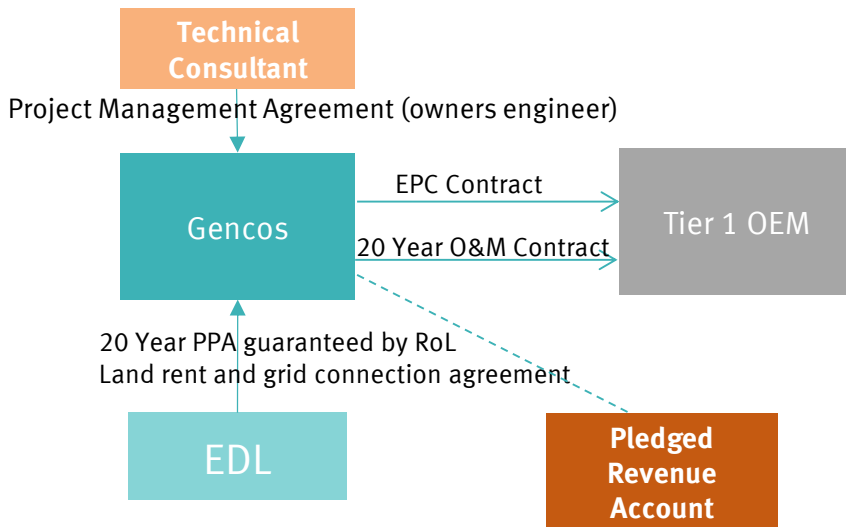
Step 1. Depositors participate on a voluntary basis in the capital raising of the Gencos



Step 2. BDL exchanges the Local Dollars with Fresh Dollars at a discount of 33%



Step 3. Gencos enter into various project agreements in a bankable structure based on a BOT scheme



Financing Structure:

The financing is proposed to be raised on a voluntary basis from depositors, via a capital raising or IPO on the Beirut Stock Exchange in local dollars. The process is proposed to be managed by BDL and CMA for the IPO, as mandated by the Council of Ministers in execution of the new proposed law¹⁴.

¹⁴ Refer to section 7. Implementation Considerations

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The execution steps are the following:

Step 1. The Initial Public Offering and capitalization of the Gencos.

- Depositors subscribe on a voluntary basis to the equity capital of two new Lebanese companies, Zahrani II SAL and Deir Ammar II SAL, the generation companies or “Gencos” with local dollars.
- The amounts to be raised in local dollars are calculated as 3 times the estimated capital costs of the projects in fresh dollars.
- Assuming the required investment amount is \$1.6 billion, this results in an IPO to raise \$4.8 billion. It is worth noting that the investment amount will be determined via a competitive procurement process further detailed in step 3 below.
- Depositors subscribe through their banks. Each bank receives an allocation of project costs, which it has to underwrite (commensurate with its market share) to sell to depositors. Any unsold part will have to be invested by the bank, since the deal is fully underwritten.
- In the event the IPO is oversubscribed, each allocation per depositor will be reduced pro rata to give the opportunity to all interested depositors to participate.
- Over the project life, depositors recoup \$7 billion in fresh dollars or 1.5x their initial capital invested in local dollars. 100% recovery is achieved in year 15 after project launch or year 13 after construction completion.
- The proposal would encourage the participation of development banks/international financing institutions with part of their local deposits estimated at around \$1.5 billion since their involvement in the capital structure of the companies will bring additional risk mitigation and governance standards.
- The following restrictions will be applied:
 - a. Depositors’ allocations will be split pro rata between the two project companies;
 - b. PEPs and banks’ shareholders/executive managers are not allowed to subscribe;
 - c. Maximum ticket per depositor to be agreed to ensure a wide and diverse shareholding base.

Step 2. Securing the needed fresh dollars

Gencos swap their \$4.8 billion local dollars for \$1.6 billion fresh dollars with BDL. On BDL’s balance sheet, this translates in a reduction of FCY gap/loss of \$3.2 billion, as assets drop by \$1.6 billion while liabilities drop by \$4.8 billion.

Step 3. Structuring a bankable Project under a BOT scheme

It is important that all the project agreements are structured according to international standards including bankability clauses to protect the interests and rights of the depositors.

Following the capital raise, a board of directors with 5 or 7 representatives selected based on meritocracy and expertise (technical, financial, legal experts) will be appointed via a voting at the General Assembly.

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The Board of Directors will manage the procurement to appoint an internationally renowned developer as a technical advisor for the Gencos and a management team. The aforementioned will be mandated by the new law¹⁵. Therefore, the Gencos will enter into:

Management Agreement

- A management agreement (including owners engineer role¹⁶) with an international developer / technical consultant, the “Technical Consultant”.

The EPC and O&M Contracts

- The Technical Consultant will run a competitive procurement only to Tier 1 OEMs (such as Ansaldo, GE, Mitsubishi or Siemens) to award an EPC contract and a 20 year O&M for:
 - a gas to power project in Zahrani II: Includes 0.9 GW -1.1GW CCGT with FSRU
 - a power project in Deir Ammar II: 0.9 GW -1.1GW CCGT plant, investment costs to include any settlement needed to resolve the government arbitration case with J&P Avax.

The Power Purchase Agreement

- The Gencos will then enter into a “construction period + 20 year” Power Purchase Agreement “PPA” with EDL, guaranteed by the Lebanese government “RoL” and will include all international bankability standards. Credit enhancement tools, such as political risk guarantees (PRG), will be requested from multilateral agencies to secure payments under the PPA.
- At the end of the PPA period, the project ownership returns to the state. Therefore, the project is structured in a BOT scheme.
- PPA will include a take or pay clause and the tariff will be denominated in US Dollars to include:
 - Capacity charge: return to the shareholders. The capacity charge will allow depositors to recoup 150% of their deposit in real dollars (or LBP at market rate) over the lifetime of the project with quarterly payments¹⁷;
 - O&M charge to compensate the project companies for the O&M fees (pass-through to EDL);
 - Gas charge as a pass-through for the natural gas cost for Zahrani only.
- The PPA payments will also be secured by a pledged revenue account where revenues from the Discos are deposited, therefore the Genco has priority from the collected revenues of the Discos.

Land Rent Agreements

- The Gencos will enter into land rental agreement with the Lebanese government (or EDL) to rent the project land for 20 years for a symbolic de-minimis amount.

¹⁵ Refer to Implementation Considerations below

¹⁶ A technical advisory role to the shareholder

¹⁷ Refer to Return to Depositors section below

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Exit for depositors/Trading of shares/Scale up of Renewables.

- Once macro-economic stabilization is achieved, the project companies can be partially sold to a global developer allowing a faster repayment of depositors.
- The generation companies (Gencos) will be listed on the Beirut Stock Exchange allowing a free trading of the shares.
- Given that the Gencos are fully funded with equity, for timing and speed considerations in the current market environment, this allows them to raise significant debt from development banks once conditions are favorable. This would allow the Gencos to invest in new renewable energy projects, becoming in essence diversified energy development companies.

2.b. Grid Upgrade and Funding

Implementation of the needed grid upgrades and investments



- EDL to appoint a technical consultant and launch a tender to upgrade the transmission and distribution grid to be able to implement the Project. The aim should be the reduction of technical losses, allowing the connection of the new power plants, the upgrading of the distribution network, and nation-wide installation of pre-paid smart meters.
- Therefore, EDL will use the 2017 masterplan prepared in conjunction with EDF with minor amendments to cater for the new projects' requirements.
- The required funding is estimated at \$400-500 million to be sourced from SDRs or ideally from the multilateral agencies. Given that the ownership of the grid remains with EDL (public sector), utilizing part of the SDR is not a bail-out to depositors or transfer of state assets to depositors.

Selected required investments include:

Transmission:

- Upgrade of the transmission network to reduce technical losses and allow the connection of the new generation projects.

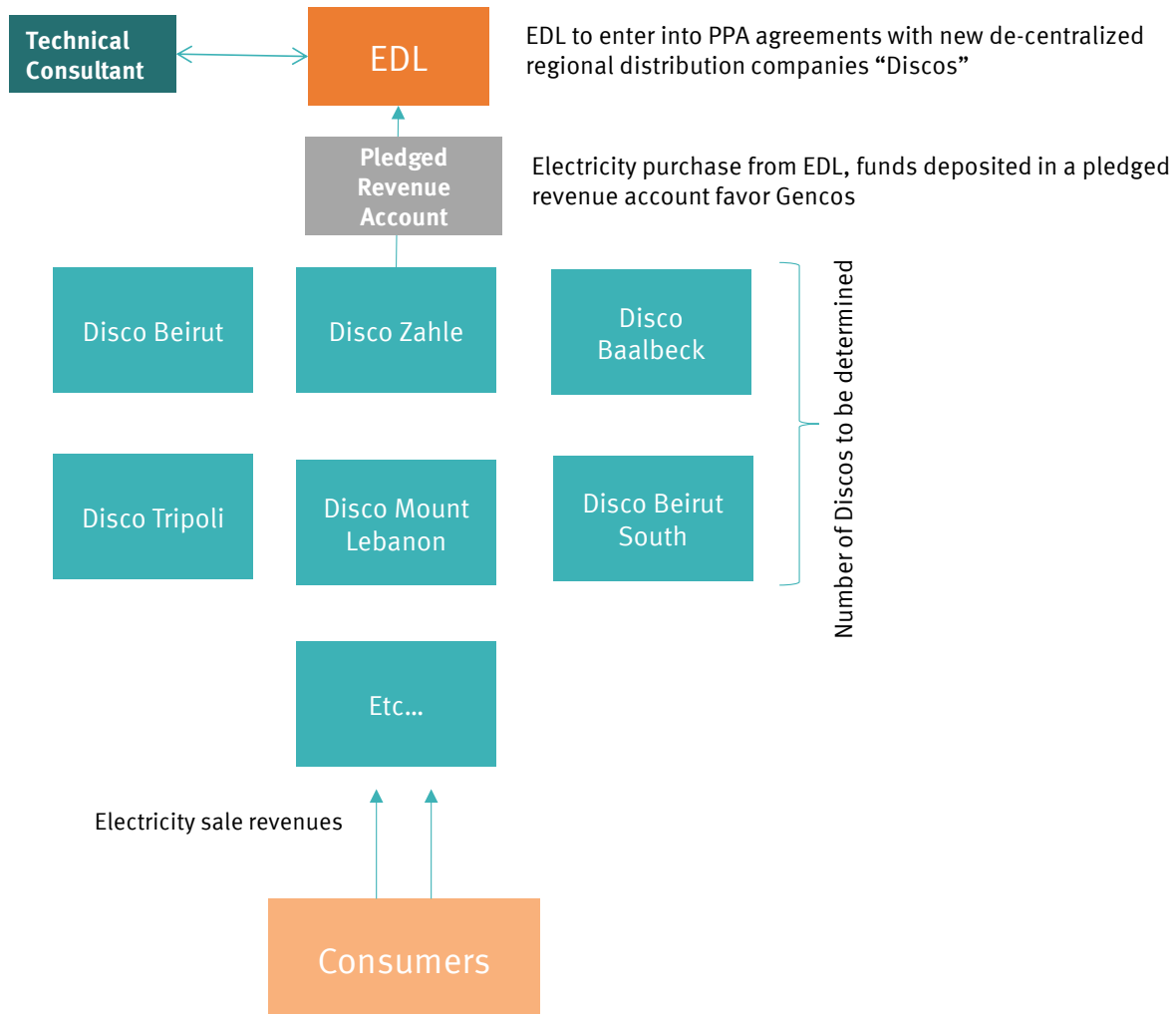
Distribution

- Rehabilitation and modernization of the national control center;
- Installation of prepaid smart-meters across the country (to be mandated by the new law);
- Upgrade of the low and medium voltage networks including cables, substations, transformers etc.

- Implementation timeline: 2-3 years (during construction period of the power plants).

2.c. The Distribution Model

Decentralized Distribution Model based on PPP



- Increasing the generation capacity without fixing the distribution model to reduce losses, especially electricity theft and uncollected amounts, will result in a larger deficit for the state.
- The proposal presents an alternative decentralized model for the distribution model, based on a PPP model, that is at the same time consistent with the political economy of Lebanon, as well as with law 462/2002 unbundling requirements when it comes to the distribution sector.
- Allow EDL, following a Council of Ministers decision, to run a competitive procurement process to award PPAs to newly established “local” distribution companies’ “Discos”. Discos will be allocated on a regional basis but smaller than the current DSPs model, taking into consideration the national grid substations’ distribution to determine the number of discos to be formed, as well as the characteristics and social fabric of the various communities.
- Discos will have the following duties:
 - Billing (based on e-bills) independently of EDL

BRIDGING THE BANKING CRISIS TO CROWDFUND ELECTRICITY REFORM IN LEBANON

- Collection via sale of pre-paid cards. Post-paid should only be allowed for domiciled accounts with good credit history;
- Maintenance of the low/medium voltage networks and the related substations.
- Discos to purchase electricity from EDL and then on-sell it to consumers, at the monthly tariff set by EDL¹⁸.
- Revenues from Discos will be deposited in a pledged account favor the Gencos and in the future other Independent Power Producers (IPP) as well. EDL will have second priority over the funds in that account once all IPP tariffs have been serviced.
- Discos will be subject to clear obligations and performance KPIs in their respective PPAs notably the good performance of duties (billing, collection, and maintenance) and timely payment of electricity purchase from EDL as per the PPA. Any breach in their obligation is considered a default under the PPA and causes for termination of their contract.
- Discos could employ EDL and private generators distribution and sales labor force, to ensure livelihood continuity for the estimated 700 and 7,000¹⁹ workforce respectively.
- Private generators employees have accumulated a good credit history of consumers and a good bill collection track record.

3. Return to Depositors

- The total required investment for the generation part is assumed to stand at \$1.6 billion. Depositors initially invest \$4.8 billion local dollars (a ratio of 3x of the required investment cost).
- The project starts generating cashflow after 18 months from the start of construction, at 2/3rd of the capacity upon the completion of the open cycle, and at full capacity after 30 months, upon full completion of the combined cycle.
- The below analysis showcases the illustrative economics of the project assuming natural gas prices average \$5.5/MMBtu over the life of the project. The resulting illustrative all-in tariff to EDL stands at 9.5 \$ cent/kwh for Zahrani (incl. gas) and 3.3 \$cent/kwh for Deir Ammar (excluding the gas charge). These levels compare to an existing average cost of production to EDL at 14.4 \$cent/kwh.

¹⁸ Refer to “Role of EDL” section below

¹⁹ ESMAP. 2020. “Distributed Power Generation for Lebanon: Market Assessment and Policy Pathways” (May 2020), World Bank, available on <https://openknowledge.worldbank.org/bitstream/handle/10986/33788/Distributed-Power-Generation-for-Lebanon-Market-Assessment-and-Policy-Pathways.pdf?sequence=5&isAllowed=y>

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- The below numbers are shown for indicative purposes and will have to be refined closer to project implementations based on actual quotes for the investment, natural gas prices and O&M charges.

Project Cost	\$	1,600	Million Dollars
Depositors Investment	\$	4,800	Million Local Dollars

Plants Capacity (MW)	2,000
Availability	95%

Yearly Output (GWh)	16,644
---------------------	--------

PPA Tariff	\$cent/kwh	\$m/year
O&M charge	1.20	200
Gas charge	6.00	999
Capacity charge	2.10	350
Total Tariff	9.30	1,548

Year	Construction Period			Yearly Cashflow
	1	2	3	4 - 22
Yearly Cashflow to shareholders (\$ million)	-	116	291	350

Depositors Cashflow over 20 year PPA	7,047	Million Dollars
Recovery to Shareholder (Cum. Cashflow/Initial Investment)	1.5x	Recovery
Years to recover 100% of initial investment	15	years after investment (13 years after start of operations)

NPV Sensitivity Analysis	Capital Cost (Discount Rate)					
	3.00%	4.00%	5.00%	6.00%	7.00%	8.00%
Net Present Value (\$ Million)	4,956	4,446	4,005	3,621	3,287	2,994
Recovery for shareholders	1.03x	0.93x	0.83x	0.75x	0.68x	0.62x

- The above analysis shows that depositors recover 1.5x their initial investment in fresh dollars over the life of the project. Full recovery of the initial investment happens at year 15. The project IRR is 3.2%, which could be reasonable if the PPA receives a political risk guarantee from multilateral agencies and since the invested funds are local trapped dollars, subject to capital controls and which could be subject to losses.

4. Cost of Electricity

4.a. Cost of Electricity to the Economy

We analyze the savings on the cost of electricity production from the implementation of the project by comparing:

- 1- Cost of electricity production prior to the implementation of the project, based on 2018 figures, whereby the 3000 MW average demand was met with EDL assets (1800 MW) at an average cost of 14.4 \$cent/kwh and private generators (1200 MW) at an average production cost of 24 \$cent/kwh.
- 2- Cost of electricity production following the implementation of the project whereby the 3000 MW is met by the Gencos (2000 MW) at the PPA tariff of 9.3 \$cent/kwh and EDL assets (1000 MW) assuming a slight reduction in cost from 14.4 \$ cent/kwh to 12 \$ cent/kwh. The reduction in cost of generation of EDL assets is stemming from the decommissioning of inefficient high cost plants and the switch to natural gas.

The resulting back of the envelope calculations show a reduction of around \$2.1 billion in the cost of electricity production, resulting from a drop in cost of production from 18.2 \$cent/kwh to 10.2 \$cent/kwh.

	Cost of Production in 2018			New Cost of Production		
	Capacity	Cost (\$cent/kwh)	Cost \$ Million	Capacity	Cost (\$cent/kwh)	Cost \$ Million
EDL	1,800	14.4	2,271	1,000	12.0	1,051
Private Generators	1,200	24.0	2,523			
Genco				2,000	9.3	1,629
Total Production Cost (\$ Million)	3,000	18.2	4,793	3,000	10.2	2,681
Yearly Saving (\$ Million)	→					2,113

4.b. Cost of Electricity to the Consumer

- In Part I, we demonstrated that, on average, the consumer paid 23 \$cent/kwh for the 3,000 MW of electricity purchased from EDL and private generators.
- This new project reduces the cost of generation to an average weighted cost of 10.2 \$cent/kwh. The cost recovery tariff including ancillary costs such as fees to Discos and transmission fees to EDL is expected to average around 15 \$cent/kwh. Therefore, with the implementation of the new Project, consumers save \$2.1 billion as shown in the table below.

	Demand (MW)	Average Cost in \$ cent/kwh	Yearly cost in \$ million
2008 Average Cost to Consumer	3,000	23	6,044
New Expected Consumer Tarriff	3,000	15	3,942
Yearly Saving to Consumer Bill (\$ million)			2,102

5. Role of EDL

- EDL's role will be constrained to managing the transmission network and the remaining power plants under its ownership, with the support of a technical advisor.
- Until the ERA is appointed, EDL will set the tariff via monthly publications of the new prices as per the new law, which would index tariffs to the LBP/USD market rate and fuel prices to ensure cost recovery, in coordination with its technical advisor.
- Once the ERA is appointed as per law 462/2002, the ERA will assume the tariff setting responsibilities.
- EDL will have to sign a dispatch priority to IPPs in general. Therefore, the Gencos will have priority to dispatch their electricity production over EDL assets, since their contracts are take or pay and Gencos' cost of electricity production is lower than EDL's assets. The same dispatch priority will also include renewables, which will have first priority given their cost efficiency.
- In essence, Gencos will be used to provide base load electricity, while EDL assets are used as peaking power plants²⁰.

²⁰ Peaking power plants, are power plants that generally run only when there is a high demand, known as peak demand, for electricity.

6. Benefits to Each Stakeholder

Stakeholder	Benefits
Economy	<ul style="list-style-type: none"> ✓ Reducing the cost of electricity, therefore enabling industrial and productive sector growth; ✓ Job creation, including some of the EDL and private generators workforce with the Discos; ✓ Approximately \$2.1 billion of direct annual savings on the overall electricity bill – payback of this investment is 1 year; ✓ Grid flexibility, reliability, and stability, which is critical to manage increased intermittency and stress from renewable energy resources. This would enable a quick deployment of the government’s large scale renewable energy pipeline, designed to (1) further reduce cost of generation, (2) allow energy security, (3) decrease pollution levels, and (4) meet the Lebanese government Paris Agreement 2030 target of 30% renewable energy mix; ✓ Ability to implement a north to gas pipeline to gasify the industrial and residential sectors; ✓ Diversification of natural gas supply ensuring security of supply (FSRU in Zahrani and Egyptian gas via the Arab Gas Pipeline in Deir Ammar); ✓ Revival of capital market activity from the listing of the Gencos on the BSE.
Government	<ul style="list-style-type: none"> ✓ Rebalancing of EDL’s financials following (1) the drop in production costs, (2) reduction of losses and (3) increase in the tariff; ✓ Elimination of state subsidies to EDL, therefore, putting the government budget on a sustainable path; ✓ No new leverage on the government to rebuild the electricity sector which supports debt sustainability efforts and IMF talks; ✓ Solution can be applied to other sectors / projects; ✓ Project can be an integral solution to IMF.

Citizens	<ul style="list-style-type: none"> ✓ 24/7 electricity to Lebanese consumers, eliminating the reliance on private generators; ✓ Pollution reduction from the gasification of the sector: Significant reduction in NOx, CO2 and fine particle emissions especially compared to HFO. Possibility to then construct the north to south gas pipeline to gasify the residential and industrial sectors; ✓ Reduction in the overall electricity bill from 23 \$ cent/kwh (prior to crisis) to approximately 15 \$ cent/kwh, resulting in more than \$2.1 billion annual savings; ✓ Depositors participation in public private partnership rebuilding the bond between citizens and public institutions, especially the electricity sector; ✓ Citizen participation in the ownership of power plants would provide also implicit mitigants against electricity theft; ✓ Diversified ownership in the generation companies from all classes and communities.
Depositors	<ul style="list-style-type: none"> ✓ 150% expected recovery for depositors, who contribute to rebuilding Lebanon; ✓ Subscription is on a voluntary basis; ✓ Depositors' recovery to be backed by a PRG from a multilateral agency. ✓ Ability to own stake in new energy development companies "Gencos" who could subsequently raise debt and invest in renewable energy.
BDL	<ul style="list-style-type: none"> ✓ Reduction in BDL FCY gap; ✓ BDL contributes to rebuilding Lebanon by releasing reserves to depositors at a discount for that purpose.

7. Implementation Considerations

IMF discussions

The Project can be launched and completed concurrently with IMF negotiations. Ideally, the government concludes an IMF deal, which ensures the sustainability of government finances, the elimination of multiple currencies and the implementation of reforms. This is an important step to de-risk the PPA.

Given that the PPA price is denominated in US Dollars, the Project would benefit largely from the finalization of an IMF program. It is important to note that all current purchases of HFO/Diesel and maintenance costs of existing power generation are denominated in US Dollars and impact the balance of payments.

However, the Project launch is not contingent on the conclusion of the IMF deal. It is worth remembering that the investment is coming from trapped local dollars, which, in the absence of an IMF deal, and with further depletion of reserves, are expected to deteriorate in value even more.

Required laws

The project requires the enactment of a new law by the Parliament, complementary to law 462/2002, which grants several rights including (but not limited to):

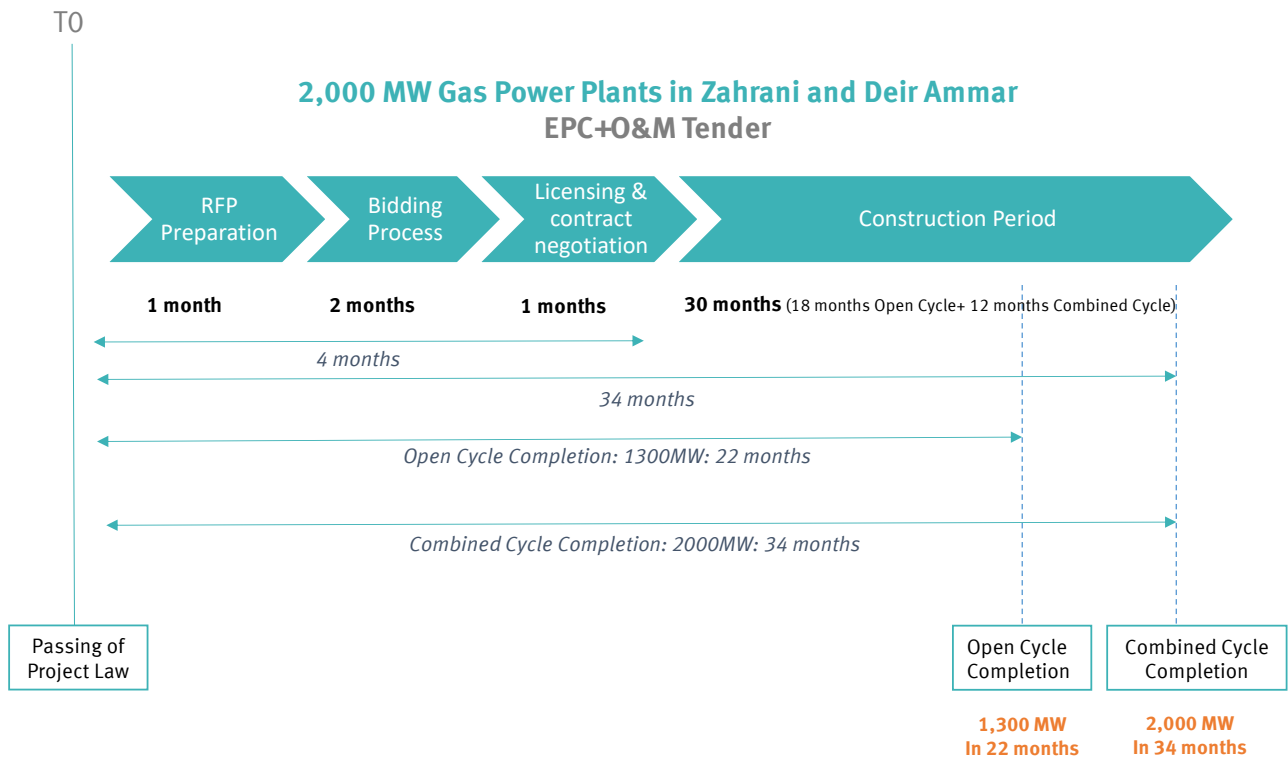
1. The set-up of two new generation companies – Gencos – Deir Ammar II SAL and Zahrani II SAL, which will be listed on the Beirut Stock Exchange. The board of directors will be composed of 5 or 7 members who are experts in energy, finance and legal matters. The appointment of the board of directors to be completed at the first general assembly meeting with simple voting. The board should then appoint a management company from tier 1 globally recognized energy developers to run the tender of the EPC and O&M contracts. Companies not to be subject to foreign ownership restrictions.
2. EDL to grant two generation licenses for up to 1.1GW each to two newly incorporated companies “Gencos” owned by Lebanese depositors, based on a construction + 20-year PPA.
3. Government of Lebanon guarantee on the PPA, which includes standard bankability provisions such as waiver of sovereign immunity and foreign arbitration.
4. Accept as a credit enhancement tool on the PPA a political risk guarantee from multilateral agencies.
5. Implementation of a PPP model for the distribution, whereby EDL will enter into various PPAs with regional Discos. Discos to be responsible for: (1) Billing, (2) collection and (3) maintenance of the low and medium voltage network.
6. Revenues from Discos to be deposited in a pledged account favor the Gencos.
7. Tariff reform²¹: Progressive tariff based on consumption, LBP/USD market rate and fuel indexed to ensure cost recovery while keeping the low consumption bracket subsidized. Tariff schedule to be issued on a monthly basis by EDL on their website, and later on by the regulator (when appointed).
8. Ability to use up to \$500 million from the SDR or to accept new multilateral funding for the needed grid upgrades, to include the installation of pre-paid smart meters and the necessary grid upgrades.

²¹ Some of the above steps may not require a law (such as tariff reform) however, they are being included to avoid cherry picking in the implementation of the Project.

8. Execution Timing

Following the passing of the project specific law, the generation project can be fully implemented within 34 months. However, the open cycle, which represents 2/3rd of the plants’ capacity of 1,300 MW can be online within 22 months from the start of the procurement process, significantly improving electricity supply. The procurement process, managed by the technical consultant, can be expedited by using the existing tender documents and technical studies for Zahrani II and Deir Ammar II. Various OEMs have already provided proposals and solutions for these two plants and should be able to provide offers within 2 months.

In parallel with the plants’ construction, EDL would have contracted the needed transmission and distribution work, which would be completed in parallel with the execution of the generation project.



9. Governance and Transparency: The Electricity Regulatory Authority (ERA)

Perhaps the most fundamental crisis is the confidence and trust crisis in the government and public administration from the Lebanese people and the international community. Therefore, it comes as no surprise that the principal reform request is the formation of an independent regulatory authority to manage the sector and allow the full implementation of law 462/2002. This request has been repeatedly rejected over the years, despite it holding the key to unlock the much-needed funding for the sector.

An independent regulator is tasked according to law 462/2002 with setting a cost reflective tariff, managing tenders, and awarding generation licenses, managing the private sector participation in the generation and distribution sectors and the interface between all the sector's players while protecting consumers.

The present proposal doesn't include the formation of a regulator in the short run, given that such request is currently not in line with the political settlement in the country, and if forced, will probably result in political appointees defeating the purpose of its establishment. The present proposal aims to achieve the same results in governance and transparency with an alternative route:

1. The generation assets licenses are awarded to the Lebanese people (depositors);
2. The tenders for the EPC and O&M will be managed by a reputable tier 1 developer;
3. The new law will mandate the indexing of the tariff for cost recovery (including fuel and FX indexation) and granting dispatch priority to the new Gencos over EDL existing power plants (but not over new renewable IPPs)
4. Appointment of technical advisors at EDL level
5. The public participation in national projects of this magnitude will promote private-public cooperation.

In the medium term, as Lebanon then embarks in scaling-up renewable energy with new utility scale IPPs, the formation of an independent and credible ERA along with the complete unbundling of the sector will become a must. Therefore, this project is only a bridge and a reform-enabling project towards the full implementation of law 462/2002.

Conclusion

Access to affordable and reliable electricity is essential for economic development and growth. It has direct impacts on health, education, gender equality, food safety, livelihoods, and poverty reduction. Just as the electricity sector has been a contributor to the collapse of the Lebanese economy, it can spark economic revival by creating jobs, reviving capital market activity, and reducing pollution and the cost of electricity. It can be a major axis in the new economic model of Lebanon based on industry, tourism, and services.

Reforms at the government level have been blocked for many years due to political bickering. Therefore, the proposed project has been designed to force the required sector reforms at the project level. It is a bridge towards the full implementation of law 462/2002 and is resilient to external shocks. It aims at resolving multiple problems at once and presents a growth-story partial and voluntary solution to depositors. The project can be launched imminently since the funding is local. Every single day delay in implementation has direct financial costs to the Lebanese economy estimated at \$5.5 million, without accounting for the environmental and opportunity costs on the economy.

If successful, the funding model can also be applied to renewable energy projects and to various sectors, such as transport, waste, water, ports etc.


With **political leadership** and **popular willpower**, Lebanon can emerge from this crisis stronger, more resilient and with a healthier economic model.



ABOUT THE AUTHOR

This paper has been prepared by Carol Ayat who is an energy finance professional and an investment banker. She has been deeply involved in policy discussions around the energy sector in Lebanon with various stakeholders including the local administration, the international financing community, international developers and manufacturers. Carol currently heads the large corporates and specialized lending department at Bank Audi and is on the board of the Lebanese Oil and Gas Initiative “LOGI”. Prior to joining the bank, she worked with Goldman Sachs with various roles in structured finance and leveraged finance in London, Dubai and New York.

The author would like to thank the AUB Issam Fares Institute for Public Policy and International Affairs (IFI) for publishing and supporting this study. The author is grateful to Marc Ayoub, energy researcher at IFI, for his invaluable contribution and review of this paper.

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