



Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 05-Apr-2023 | Report No: PIDC35768



BASIC INFORMATION

A. Basic Project Data

Country Lebanon	Project ID P180501	Parent Project ID (if any)	Project Name Lebanon Distributed Renewable Energy (P180501)
Region MIDDLE EAST AND NORTH AFRICA	Estimated Appraisal Date Sep 29, 2023	Estimated Board Date Dec 01, 2023	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing	Borrower(s) Lebanese Republic	Implementing Agency Electricité du Liban (EDL), Ministry of Energy and Water	

Proposed Development Objective(s)

To provide clean and affordable electricity services to selected public services, households, businesses and communities, and strengthen the capacity of the utility to integrate solar generation

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

Total Project Cost	150.00
Total Financing	150.00
of which IBRD/IDA	150.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	150.00
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Environmental and Social Risk Classification
Substantial

Concept Review Decision
Track II-The review did authorize the preparation to continue



B. Introduction and Context

Country Context

- 1. Lebanon has been facing multiple crises for almost 3 years, beginning with an economic and financial meltdown, followed by the impacts of the COVID-19 pandemic and finally the Port of Beirut explosion.** In 2021, real Gross Domestic Product (GDP) is estimated to have declined by 10.5 percent on the back of a 21.4 percent decline in 2020 and a 6.7 percent decline in 2019. Currency depreciation, high inflation and prices have pushed many households below the poverty line. In 2021 alone, the Lebanese population living under the poverty line has risen by 9.1 percent. Furthermore, it is estimated that almost 30 percent of the population is unemployed, with youth unemployment reaching an alarmingly high rate of almost 50 percent¹. Adding to that, informal employment now makes up 60 percent of total employment in Lebanon.
- 2. Access to basic services, which was already minimal before the crisis, has currently been brought to a complete collapse.** Acute shortages of fuel have exacerbated the already constrained electricity supply, causing blackouts that could last up to 23 hours per day. This has forced households and businesses to increasingly rely on the much more expensive diesel-based private generation to secure basic electricity needs, with many households unable to afford the switch. Lebanon's water establishments have not been able to pump enough water to their customers because of the shortages in electricity and the rising costs of spare parts, which are all denominated in foreign currency. The same applies in the telecom sector, as fuel shortages and the inability to procure spare parts are causing internet outages, especially in remote areas (mostly poor) where operators don't have backup generators and/or where the procurement of fuel is more difficult. Food insecurity has also become prevalent, as more than 50 percent of Lebanese households currently experience food shortages. Food prices have increased by a staggering 390 percent between March 2021 and March 2022 alone. Struggles to access healthcare services have also aggravated over time, with more than 50 percent of households being unable to access medication due to shortages and hoarding, and 34 percent of children lacking access to primary healthcare².

Sectoral and Institutional Context

- 3. Electricité du Liban (EDL), the vertically integrated national utility established in 1964, has been in structural deficit for over a decade, compounded by governance and operational inefficiencies.** Although the majority of EDL's generation assets were designed to use cheaper, more efficient, and less polluting natural gas, they have operated on expensive and polluting diesel and heavy fuel oil (HFO) for decades. Private sector participation has been limited to performance-based service contracts in the distribution sector that have not been able to yield the desired results. In 2016-2019, network losses accounted for a staggering 38-56 percent of total energy generated. In 2018, for example, EDL's losses accounted for 39 percent, comprising 4 percent of technical losses on the transmission network and 35 percent on the distribution network (9 percent of technical losses and 26 percent of commercial losses). EDL's increasing capacity deficit and chronic shortage over the past decades has been met by private diesel generators operating under subscription-based arrangements, in a complex informal economy resistant to regulations and government oversight.
- 4. The grid services have almost entirely collapsed over the past two years, in the absence of fiscal space to maintain the status quo.** The repercussions of the economic meltdown has exacerbated EDL's already strained financial and operational situation. EDL's generation fell by an estimated 17 percent year-on-year in 2020 compared to 2019,

¹ ILO. 2022. Lebanon follow-up Labour Force Survey January 2022

² UNICEF. 2022. Surviving without basics. Accessed from: <https://www.unicef.org/lebanon/reports/surviving-without-basics>.



causing widespread electricity blackouts. From mid-2021, EDL's supply has dwindled to an average of 2-3 hours per day. This drop in generation was mainly caused by fuel shortages and EDL's inability to secure cash and FX for payment. Since mid-2021, grid supply hangs on an oil barter deal with Iraq that barely allows for 1 to 2 hours of daily electricity services, while the financially distressed EDL accumulates payments arrears to private contractors and operators. Facing total obliteration of the sector, the Government developed a National Emergency Plan, focusing on short term measures to increase revenues, the implementation of which has barely started to date.

5. Grid collapse and extremely high fuel costs have accelerated transition to renewables through scattered bottom-up initiatives, despite the legal vacuum. With the removal of fuel subsidies and the increased reliance on generators, the deployment of standalone solar PV systems, including battery energy storage systems, has accelerated to meet the demand from households, economic agents, buildings, and communities, albeit in the absence of a legal framework for distributed generation operating on parallel distribution networks. Total installed capacity of off-grid PV-based systems has reached 500MWp in 2022 operating on standalone or island basis, from 100MWp in 2020. The demand came from those who can afford the upfront capex in the absence of a functional banking sector. Current Distributed Renewable Energy (DRE) projects are mostly small-scale, grant-based interventions without systematic vision or planning leading to long-term recovery.

6. Energy recovery and transition can build on existing bottom-up renewable energy (RE) uptake, and gain speed and scale incrementally, along with progress achieved at sector, policy and macro-fiscal levels. At the current juncture, solar PV and hybrid systems are operating on standalone basis, in the absence of reliable grid services and EDL's unreadiness to accommodate net-metering arrangements. With minimum grid supply secured, reactive power and adequate dispatching, DRE systems would feed in a functional grid. The operationalization of an appropriate legal framework would create the conditions to mobilize private sector for the deployment of DRE systems across the country. Switching EDL's generation assets from liquid fuel to cheaper and cleaner natural gas, through pipeline gas or liquified natural gas (LNG) imports, would support the grid to supply 24-7 electricity with maximized contribution from renewable energy. Macro-fiscal stabilization would allow private capital mobilization (PCM) for utility-scale RE projects by Independent Power Producers (IPPs) identified through least cost planning and procured through a structured and standardized competitive process, to increase available supply in line with the goals of the Paris Agreement³.

Relationship to CPF

7. The proposed Project will contribute to advancing the Country Partnership Framework FY17–FY22⁴ (CPF Report Number 94768) objectives and the World Bank's twin goals. The CPF works through two focus areas to renew the social contract between the state and citizens: (a) expand access to and quality of service delivery; and (b) expand economic opportunities and increase human capital development. Poor delivery of electricity supply was identified as a binding constraint to Lebanon's economic development. Inefficiencies in the electricity sector continue to have ripple effects on the lives of Lebanese citizens as well as refugees. Poor electricity services not only increase the cost of living as people cope with energy deficiencies, but they can also have deleterious impacts on key sectors, including job opportunities, education, water, and health care services, as well as on business activities, which are critical for recovery from the current economic, financial, and health crises. These benefits can contribute to the country's inclusive growth, and, in turn, the World Bank's twin goals of ending extreme poverty and boosting shared prosperity.

8. Moreover, the SCD is currently being updated for Lebanon, to inform the next CPF. In the ongoing exercise of updating the SCD, the collapse of electricity sector has been identified as a central challenge affecting multiple fronts of the economy, resulting in devastating impacts on critical services (e.g., water supply and sanitation) and livelihood. The

³ The Paris Agreement's overarching goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels"

⁴ the CPF term has been extended for an additional year, as stated in the Performance and Learning Review (PLR) of the CPF.



ongoing exercise of the Lebanon Country Climate and Development Report (CCDR) also recognizes the critical importance of electricity services in the context of both economic recovery and coping with climate change. Recovery of the electricity sector, through cost-effective renewable energy, is a must for both the growth and climate agendas.

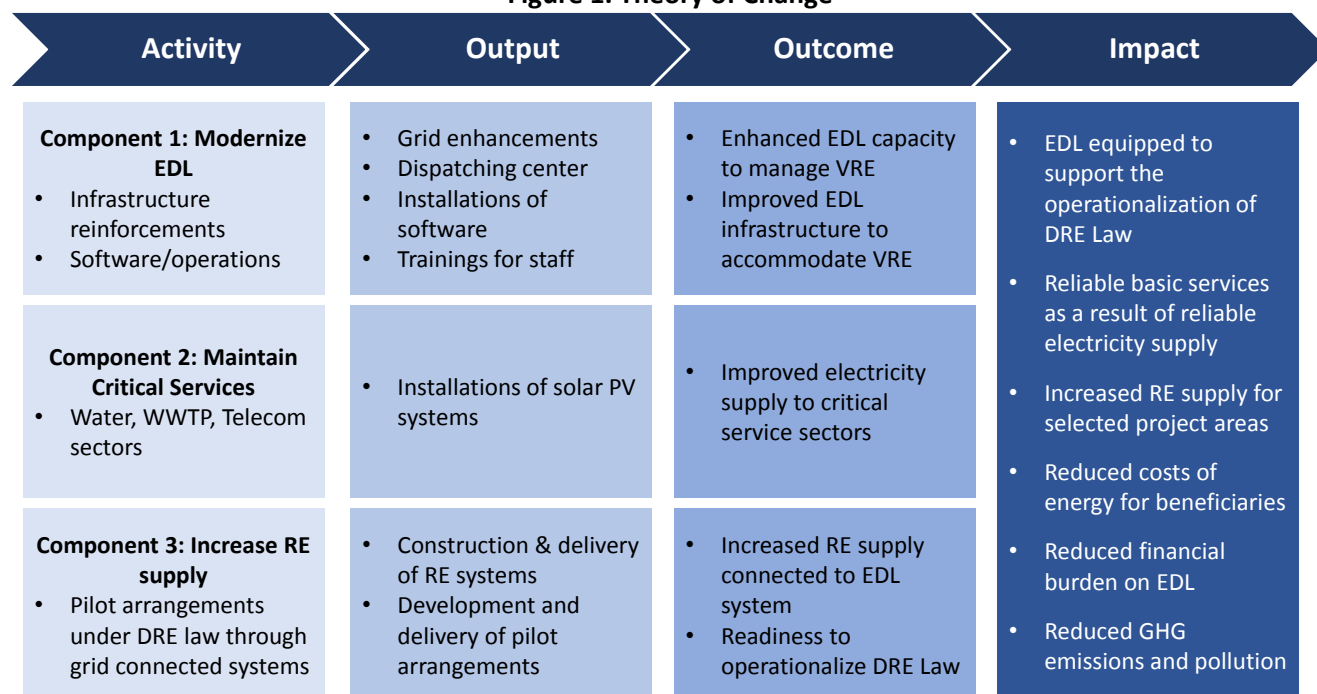
C. Proposed Development Objective(s)

To provide clean and affordable electricity services to selected public services, households, businesses and communities, and strengthen the capacity of the utility to integrate solar generation.

Key Results (From PCN)

9. The main results (PDO level indicators) arising upon completion of the proposed Project are expected to be:
 - Variable Renewable Energy (VRE) integration capacity enabled by the Project (MWp)
 - RE capacity installed and/or rehabilitated (MW)
 - Reduced average generation cost of electricity for selected public services (US\$/kWh)
10. Figure 1 outlines the Theory of Change of this Project, indicating the outputs, outcomes and impacts anticipated from this Project.

Figure 1. Theory of Change



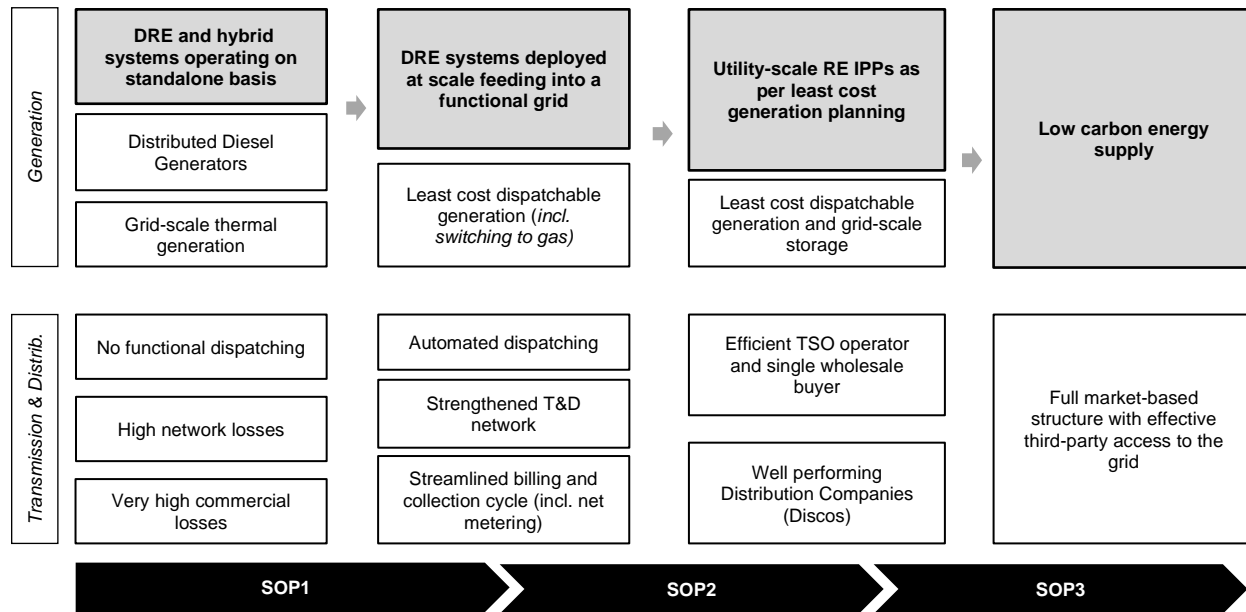
D. Concept Description

11. **The contemplated WB intervention is through Investment Project Financing (IPF) underpinned by a Series of Projects (SOP), to balance the need of immediate action to support DRE uptake under current circumstances, as well as**



the need for longer-term, sustained trajectory to support sector recovery. Figure 2 outlines the contemplated pathways towards Recovery of the Electricity Sector and Energy Transition (RESET).

Figure 2 – Lebanon’s Pathway towards Recovery of the Electricity Sector and Energy Transition (RESET)



12. **The Bank would support the Recovery of the Electricity Sector and Energy Transition (RESET), through a tailored series of projects (SOP) approach.** The RESET agenda, as outlined in Figure 3 below, could be one pathway towards sustainable recovery of the sector featuring high penetration of low-cost, renewable energy. The first operation (the proposed IPF) focuses on “no regret” actions, as well as technical and operational requirements to advance the RESET agenda. Moving to subsequent operations (SOP2 and SOP3) will be subject to meeting key enablers, identified in Figure 3. For example, upon the implementation of SOP1 which focuses on deploying DRE and strengthening EDL systems, EDL could gradually manage to increase its revenues to cover for operating costs (as a result of streamlined billing cycle, application of the new tariff and loss reduction campaigns) ; coupled with the operationalization of the DRE Law. SOP2 could be initiated to conduct more substantial grid reinforcements, support the mobilization of private capital to scale-up DRE deployment and pilot renewable IPP projects. Upon the implementation of SOP2, and assuming Lebanon manages to achieve macro-fiscal stabilization, SOP3 could be initiated to support utility-scale IPPs through significant PCM. In view of Lebanon’s complex environment, the proposed approach does not predict when enabling conditions would be fulfilled to move to subsequent operation, yet it creates the opportunity for Lebanon to gradually demonstrate its resolve to change the status quo, build more confidence and galvanize external support to advance sector reform agenda.

13. **The SOP approach will be complemented by a Programmatic Advisory Services and Analytics (PASA), which provides support to the Government in creating, through selected critical reforms, the enabling environment to advance RESET and prepare for future lending operations.** The proposed PASA, Lebanon Energy Transition and Recovery Program (P179937), includes two main pillars i.e., “Energy Transition”, and “Sector Reforms”. The two pillars cover a number of thematic activities, on DRE Scale-up Assessment, VRE Integration Analysis, EDL Modernization Support, Distribution



Concession Model Analysis, and Operationalization of Regulatory Framework, among others. The immediate focus of the PASA would be to support the necessary due diligence and analytics needed for the design of the proposed IPF operation.

Figure 3 – Key enablers to RESET and proposed Bank’s support (SOP and PASA)

Stage	Key enablers	SOP operations	PASA
1 <i>standalone DRE and hybrid systems and pilot grid connected approach</i>	<ul style="list-style-type: none"> - EDL financial reporting in compliance with industry standards 	SOP1 <ul style="list-style-type: none"> - Strengthen EDL systems (incl. critical network upgrades) - Deploy stand-alone systems for selected critical public services - Pilot grid-connected DRE systems / solar project(s) 	<ul style="list-style-type: none"> - DRE related due diligence (technical, financial & business model analysis) - Roadmap analysis for EDL long-term recovery - EDL’s opening balance and sector wide cash waterfall mechanism - Operationalization of DRE law and regulatory framework - Alternative models for distribution
2 <i>DRE systems deployed at scale into a functional grid</i>	<ul style="list-style-type: none"> - EDL’s revenues cover for OPEX (w/ min. supply to stabilize the grid) - DRE law is effective - EDL readiness for net-metering 	SOP2 <ul style="list-style-type: none"> - Grid reinforcements - Scale-up DRE (PCM) - PPP for distribution (PCM) - RE IPP pilot - Fuel switch to gas 	<ul style="list-style-type: none"> - VRE integration study including transmission investment planning - Technical assistance to support EDL functional unbundling - Design and implementation support for standardized competitive process for RE IPPs
3 <i>Utility-scale RE IPPs as per least cost generation planning</i>	<ul style="list-style-type: none"> - Macro-fiscal stabilization (FX) - Fully functional regulatory framework - Grid readiness for significant VRE 	SOP3 <ul style="list-style-type: none"> - Network reinforcements - RE IPPs (PCM / guarantee) 	<ul style="list-style-type: none"> - Updated Least Cost Generation Planning - Technical assistance to support EDL corporatization as transmission system operator (TSO) and single buyer

14. **The proposed operation (SOP1) will focus on sector technical readiness for energy transition and on “no regret” actions** to provide clean and affordable energy services to selected public services, households, businesses and communities. It will prioritize most critical public service delivery and areas where disruption of grid services is most severe, affecting primarily the poorest and most vulnerable. It will also strengthen the utility, EDL, to integrate variable RE generation into the grid and improve its operational performance. The proposed activities would pave the way for subsequent RE scale-up. Proposed components are: (1) Strengthen EDL systems to accommodate significant VRE supply (including critical network reinforcements and digital infrastructure enhancement); (2) Strengthen critical public services affected by grid disruption, through stand-alone RE systems, notably for water pumping stations (PS), Waste Water Treatment Plants (WWTP) and telecom services; and (3) Increase RE supply, through grid-connected RE systems in selected areas while piloting approaches envisioned in the DRE Law.



Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	TBD
Projects in Disputed Areas OP 7.60	TBD

Summary of Screening of Environmental and Social Risks and Impacts

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APPROVAL

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