AMERICAN UNIVERSITY OF BEIRUT

COMPREHENSIVE RESTRUCTURING AND PRIVATIZATION OF ELECTRICITE DU LIBAN

by

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First and foremost, I would like to thank my family for their overwhelming love, encouragement and support.

I would like to express my sincere appreciation to my readers Dr. Karim Rebeiz and Mr. Chafic Abisaid for their valuable comments and guidance and to the persons I have interviewed and whose feedback was of major importance for the accuracy of this study.

I would also like to address my gratitude to my friends for their continuous help and support and especially Elie and Mathilda.

Finally, I would like to dedicate this work to my dad who stood by me all along and gave me great guidance and advice.
Electricité du Liban (EDL) is the sole player in Lebanon’s energy sector. As a vertically integrated state-owned monopoly, EDL controls the generation, transmission and distribution of electricity in Lebanon. As a State Owned Enterprise, EDL suffers from severe financial and operational mismanagement. As a result, EDL fails to deliver a reliable power supply to the Lebanese population. The power infrastructure has further been significantly impacted by the country’s civil war, which ran from 1974 to 1990. More than nineteen years after the end of the war, EDL still has significant operating inefficiencies and is continually incurring annual losses. Major problems in bill collection have not been solved and electricity theft is still an issue. The generating capacity is partly obsolete and needs significant repairs. Although electricity rationing has been gradually reduced after the end of the war, consumers still suffer frequent scheduled and unscheduled power outages.

The Lebanese government tried numerous times to launch much needed administrative reforms before deciding the privatization implementation. In fact, the parliament voted for two new laws, the Privatization law n° 228 dated May 31, 2000, and the Electricity law or the Law of Electricity sector Organization n° 462 dated September 5, 2002, in order to induce the reform of the electricity market, from a regulated national monopoly into a competitive market. Nevertheless, all efforts remained in vain, the laws were not applied, and no improvement of the EDL performance was registered.

This paper provides a comprehensive reform proposal for the Lebanese Government, tailored to suit the Lebanese case, focusing on four major restructuring steps or milestones for the Lebanese Electric Power Sector: “Corporatization”, “Divisionalization”, “Unbundling” and finally “Private Sector Participation”.

Title: Comprehensive Restructuring and Privatization of Electricité du Liban
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To my parents:
Antoine and Houda

and my sister:
Caline
CHAPTER I
INTRODUCTION

A. Background

The Lebanese electric Power sector is predominantly represented by Electricité du Liban (EDL), a vertically integrated public electric utility. EDL generates, transmits, distributes, and supplies electric power to Lebanese citizens. EDL is under the tutelage of the Ministry of Energy and Water.

EDL is at the heart of a serious crisis. It is unable to provide reliable electricity to its consumers. It is a considerable drain on the Lebanese government’s expenditures, crowding out more important payments on social protection, education, health and infrastructure. In fact, Lebanon’s macroeconomic crisis and large budget deficit is very much linked to the poorly performing electric power sector.

Unreliable provision and high cost of electricity supply are major concerns for Lebanon. Parts of the country are only served for several hours a day and unscheduled black-outs occur frequently. Due to high technical losses, unauthorized electricity use, and insufficient bill collection, significantly more than 40% of sent out electric energy remains unpaid. Besides, too low revenues result also from tariffs that have not been changed since 1994 and the rise of fuel costs, and have led to the deterioration of the financial situation of EDL.

The administrative and accounting systems at EDL are outdated and partly obsolete. They are largely paper-based. Organizational structures, processes, and work procedures need to be updated and upgraded.
The average age of EDL’s employees is about 58 years, reflecting a freeze on hiring new personnel in force since 1985. The nominal number of about 5,000 employees contrasts with the actual number of less than 2,000 employees at EDL. The staff is supported by about 1,800 workers with daily or short time contracts.

The Lebanese government tried numerous times to launch much needed administrative reforms before deciding the privatization implementation. Nevertheless, all efforts remained in vain and no improvement of the EDL performance was registered; it even deteriorated.

As such, the primary objective of this study is to figure out in details the steps necessary for the restructuring of Electricite du Liban prior to privatization, and to determine the privatization structure or model that suits best the Lebanese market.

B. Main Focus and Organization of the Study

This study addresses the aforementioned objective by focusing its research and analysis on the literature review and on the opinions and viewpoints of experts and specialists having a large grasp of EDL problems.

The paper starts with a general review of the available literature on privatization and on deregulation of the electricity sector, and then it describes in details the current situation of EDL. The paper continues on reviewing, analyzing and criticizing the steps that has been taken by the Lebanese Government to provide a legal framework for the restructuring process. Then the analysis focuses on the interviewees’ perspectives on EDL problems and their recommendations on the potential solutions to be able to draw a comprehensive restructuring and privatization model for EDL.
Chapter II is divided into two sections. The first section provides an overview on privatization, the different privatization techniques, its effect on company performance, on government fiscal conditions, on the capital market development, on employment, and on poverty. The second section provided an overview of the electricity sector, electricity deregulation and of the different electricity privatization models.

Chapter III describes in details the current situation of EDL and sheds the light on its numerous problems including financial, managerial and technical problems.

Chapter IV depicts and analyses the legal framework for privatization of the Lebanese Electric Power Sector.

Chapter V portrays the research methodology used for conducting the interviews.

Chapter VI presents the results of the interviews and draws recommendations for the Lebanese Government on the model to follow for the restructuring and privatization of EDL.

Chapter VII concludes the paper.
CHAPTER II

BACKGROUND ON PRIVATIZATION AND DEREGULATION

A. Definition of Privatization

The term privatization is typically used to describe the transfer of activities from the public sector to the private sector. Ravi Ramamurti argues that privatization “refers to the sale of all or part of a government’s equity and state-owned enterprises (SOEs) to the private sector”. (Ramamurti, 1992).

Privatization programs have been dominating most of the public policy programs over the last twenty years, transforming by that the economic landscape. Indeed, over this period of time, more than one trillion US Dollars were passed from public to private hands. (Dyck, 2000) Moreover, according to Kikeri and Koro, between and 1990 and 2003, 8,000 privatization transactions were carried out in 120 developing countries, generating more than US$ 400 billion in proceeds, and according to Kikeri and Phipps, in 2006 alone, 249 privatization transactions generated US$ 105 billion (Figure 1).

Privatization has covered all of the economic sectors and in 2006, the Infrastructure (Electricity, natural gas, transport, telecommunication and water), Energy and Finance (banking and insurance) sectors accounted for more than 80% of total proceeds (Table 1).
Fig. 1. Value of Privatization Transactions in Developing Countries, 1990-2006

Note: Data for 2006 excludes 2 Initial Public Offerings in China (Industrial and Commercial Bank of China & the Bank of China) for US$ 35.7 billion

Source: Kikeri and Phipps (2008)

Table 1: Privatization Transaction in Developing Countries by Sector, 2005-2006

<table>
<thead>
<tr>
<th>Sector</th>
<th>2005 Value (US$ billions)</th>
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<th>2006 Value (US$ billions)</th>
<th>Transactions</th>
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<tbody>
<tr>
<td>Infrastructure</td>
<td>24.7</td>
<td>87</td>
<td>23.4</td>
<td>110</td>
</tr>
<tr>
<td>Electricity and natural gas</td>
<td>1.2</td>
<td>22</td>
<td>5.3</td>
<td>32</td>
</tr>
<tr>
<td>Transport</td>
<td>7.8</td>
<td>30</td>
<td>7.1</td>
<td>39</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>15.3</td>
<td>22</td>
<td>10.9</td>
<td>30</td>
</tr>
<tr>
<td>Water and sewerage</td>
<td>0.4</td>
<td>13</td>
<td>0.2</td>
<td>9</td>
</tr>
<tr>
<td>Energy</td>
<td>2.2</td>
<td>9</td>
<td>19.9</td>
<td>12</td>
</tr>
<tr>
<td>Finance</td>
<td>15.5</td>
<td>39</td>
<td>12.9</td>
<td>32</td>
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<tr>
<td>Competitive</td>
<td>10.1</td>
<td>148</td>
<td>10.1</td>
<td>82</td>
</tr>
<tr>
<td>Primary</td>
<td>0.4</td>
<td>5</td>
<td>2.8</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>53.3</td>
<td>288</td>
<td>69.1</td>
<td>247</td>
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Note: Data for 2006 excludes 2 Initial Public Offerings in China (Industrial and Commercial Bank of China & the Bank of China) for US$ 35.7 billion

Source: Kikeri and Phipps (2008)
B. Types and Techniques of Privatization

According to Guislain and Kerf (1995), there are various types and methods of privatization which differ in duration and risk involved (Figure 2).

Supply and service contracts (first four options in figure 2) tend to be of short duration and involve the least private commitment amongst the privatization options. In these contracts, the private contractor does not have the responsibility of providing the service. Instead, the private contractor is responsible for different tasks such as: construction works, inputs supply, customers’ billing, facility maintenance…

The last four options in figure 2 are concession-type arrangements: Leasing (affermage), Build-Operate-Transfer (BOT) and Concession (stricto sensu), Build-Own-Operate (BOO) and Divestiture. In these contracts (explained in details in Box 1), the government delegates the private sector the right and the power to provide a certain service while retaining some control over the sector. This control is through the incorporation of a concession contract which contains the terms and conditions governing the project as well as the rights and obligations of the private contractor.

In the Affermage contract, the private contractor is responsible for providing the service. Moreover, he is responsible for Operations and maintenance activities and enjoys full managerial responsibility. The private contractor provides these services in exchange for a lease fee paid by the government.
A. **Management Contract**
- Short-term (3-5 years) contract;
- Private company is responsible for Operations and Maintenance and has full managerial responsibility;
- Public sector bears losses;
- Investments are done by the public sector but could be managed by the management contractor on implementation fee;
- Private company could manage the investment program (procurement, supervision of preparation and implementation);
- Bills are collected by the private company;
- Tariffs and levels of service are decided by government and specified in the contract;
- Financial criteria for selection of the private company is based on management fee;
- Compensation is based on fixed fees (to cover cost of the management contractor) and, in performance-based management contracts, a performance bonus is added based on the results and/or achievement of specific service and performance targets/criteria defined in the management contract;
- Management contracts are lengthy and time consuming to develop and to enforce;
- Risks:
  - Little or no incentive to improve efficiency unless the performance-based reward is significant;
  - Contractor may run down the assets unless enforcement is effective;
  - Little or no incentive to train local counterparts adequately.

B. **Lease Contract (Affermage)**
- Medium-term (5-15 years) contract;
- Contractor is responsible for operations and management and for financing working capital and replacement of short-lived assets;
- Contractor bears full commercial risk of operations and maintenance and has thus incentives and often obligations to reduce costs and maintain long term value of the leased assets;
- Customers are clients of the private company, which usually collects the tariff revenue directly and returns an agreed portion to the state as a rental or license fee;
- Contractor profit is the difference between the gross revenues collected and the sum of operating costs and this fee;
- Investments are done by the public sector, which remains responsible for debt servicing;
- Tariffs are set by government and specified in the contract;
- Financial criteria for selection of the private company by percentage of net income and part of tariffs reserved to lease;
- Fees usually linked to performance and revenues;
- Leasing requires fairly detailed preparation and staff reduction;
- Need to define service targets and what investments the government will finance;
- Risks:
  - Mismatch between investment policies and pricing;
  - Mismatch between service targets and investment policies;
  - Does not address the public sector’s financing problem (high cost of capital, limited resources).

---

**Fig. 3 Principal Options for Private Sector Participation in Infrastructure**

*Source:* Adapted from Shehadi (2002)

In the Concession *stricto sensu*, the private contractor has the responsibility of financing new investments on top of all the responsibilities of the affermage contract.

It is worth mentioning that, at the end of the concession term, the assets are returned to the state, in the case of Leasing contracts, BOT and Concession *stricto sensu*.

In the BOO and divestiture, the assets will be will be sold to the private sector.
The BOT refers to “Greenfield concessions”, and BOO is similar, however without a transfer of asset at the end of the period. In the Divestiture, the ownership of assets will be transferred to the private sector. The latter will be responsible for the future expansion of the company. (Guislain and Kerf, 1995)

C. Concession Contract
- Long-term (25-30 years) contract with a private company;
- Concessionaire is fully responsible for operation and maintenance of the system, including its commercial risk, and for the construction or rehabilitation of the system;
- Concessionaire finances the investment costs of the system, including replacement costs and the working capital required for its operation and maintenance;
- Selection of concessionaire is best if based on charging the lowest tariff to consumers while committing to meet service levels and performance targets and not on the highest concession fee, the highest net present value of future revenue streams, or the largest amount of new investments to be made;
- Concessionaire’s compensation is based on tariffs, which are determined according to agreement set out in the concession contract. The tariff revenue should be sufficient to cover the operational expenses as well as debt services and depreciation on the concession’s investment. Tariffs are usually reassessed every few years based on an updated investment plan and estimates of expenditures. An inflation index formula may be agreed upon in the contract;
- Concessionaire provides both expertise and capital;
- Concession contract and procurement require detailed preparation to create competition for the market (to substitute for the lack of competition in the market);
- Concessions require effective contract monitoring;
- Risks:
  - Badly designed contracts create problems between private firms and the state;
  - Cream skimming, i.e., providing coverage only where it is profitable. Strict service targets help mitigate this risk;
  - Exclusivity may not be commensurate with universal service obligations.

D. Divestiture
- Infrastructure owned by an incorporated entity (corporation);
- Corporation operates the infrastructure under a license of limited duration (15-20 years for telecommunications; more for other types of infrastructure);
- All or part of this entity is sold to private interests;
- Divestiture transfers ownership of assets to the private sector;
- Investments and working capital are financed by the corporation, which in turn may access capital markets;
- Requires a sophisticated, effective, and independent regulatory structure;
- Requires elaborate formulae for setting tariffs in non-competitive sectors;
- Divestiture envisages periodic renegotiation with the regulator.
- Risks:
  - Diminished competition unless alternative infrastructure is made available;
  - Regulatory capture if regulator is weak.

Fig 3 (Continued) Principal Options for Private Sector Participation in Infrastructure
Source: Adapted from Shehadi (2002)

Brada (1996) divides divestiture into four categories: “Privatization through restitution”, “Privatization through sale of state property” (taking two forms, “Direct
“sale” and “Share Issue Privatization”), “Mass or Voucher Privatization” and “Privatization form below”.

In the first method, privatization through restitution, a property that was expropriated for many years is returned or restituted either to the original owner or to one of his inheritors (Megginson and Netter, 2001). This method is mostly observed in Eastern Europe.

The second method, Privatization through sale of state takes two forms, Direct sales and Share issue privatization. In a direct sale, the public sector sells a fraction or the entire State Owned Enterprise (SOE) to the private sector. Asset sales could be done through auctions, which is the most common method, or the assets could be directly sold to the private investors (Megginson et al, 2004). This method can be observed mainly in Mexico, where they relied largely on Asset Sales in their national privatization program (La Porta et al, 1999). In the Share Issue Privatization, the public sector sells equity shares of the SOE in the public capital market to private investors (retail or institutional). This method is similar to Initial Public Offerings (IPO) that are applied in the private sector.

The third category, Mass or Voucher Privatization, is similar to the Share Issue Privatization. In this method, the public sector distributes vouchers to citizens. The vouchers are usually free of charge or sold at nominal cost. (Megginson et al, 2004) The vouchers represent proof of share ownership in the assets of the SOE. This method was implemented solely in “the transition economies of central and Eastern Europe” (Russia, Czech, Slovak...) since Share Issue Privatization were “politically unacceptable” in these countries because the communists were the only people having enough resources to acquire shares in the SOEs (Megginson et al, 2004). According to Shafik (1996), mass or
voucher privatization programs have many attractive features that include “providing a means of rapidly privatizing firms for which there are few buyers, the introduction of popular capitalism, and the garnering of political support for privatization”.

The fourth method, Privatization from below, describes the startup of new firms that are owned by the private sector, in countries that were previously socialist, including China, Latin America, “the transition economies of central and Eastern Europe”, and Sub-Saharan Africa (Megginson and Netter, 2001).

C. Impact of Privatization

Privatization had in most of the cases, a positive impact on the company and on the countries in which this reform was implemented. In this section, we will review the impact of privatization on: Operating and financial performance (Profitability and operating efficiency), Government fiscal conditions, employment, capital market development and poverty.

1. Impact on Performance

According to academic research, it is well established by now, and there is almost unanimity that privatization of SOEs has lead to improvements in both operating and financial performance of the company, in developing and developed countries. This concept of improvement in efficiency is not new. In fact, in 1776, Adam Smith wrote (adapted form Sheshinski and Lopez-Calva, 1999):

“In every great monarchy in Europe the sale of the crown lands would produce a very large sum of money, which, if applied to the payments of the public debts, would deliver from mortgage a much greater revenue than any which those lands have ever
afforded to the crown… When the crown lands had become private property, they would, in the course of a few years, become well improved and well cultivated” (Smith, 1776).

However, there is less consensus regarding the reasons of the improved performance. There are two major schools of thoughts regarding this issue.

The first school of thought argues that in SOEs there are poor incentives for efficiency. According to Sheshinski and Lopez-Calva (1999), this perspective is named “Agency View”, and is divided into two parts, or two perspectives, the “managerial perspective” and the “political perspective”.

In the managerial perspective, managers of SOEs have low incentives for efficiency because of the poor monitoring. According to Goldeng et al (2008), the reason behind the inefficient monitoring of the managers by their principals is because they are less exposed to “the disciplining and learning forces of the market”. In fact, since SOEs are not traded in the market, this eliminates the take over threat provided that the firm performs poorly. Moreover, shareholders do not observe the performance of the SOEs, as is the case of private companies.

In the political perspective, low efficiency in SOEs is the result of the goal of any government to maintain political support. Public managers usually report to politicians, who like to “remain in power and enjoy the perquisites of their office” (Shleifer, 1998). Hence, public managers have long channeled benefits to the government’s political supporters at the cost of the SOE’s efficiency and political reputation and prestige. According to Shleifer (1998), governments have abused of their control of SOEs as a means of directing these benefits to their supporters through forcing excess employment at above-market wages and through creating new projects in the sole purpose of transferring wealth to the supporters. The last point or “the transfer of wealth
to constituents through the use of government-owned assets in exchange for political support” is commonly identified as “patronage”. The reason why public managers are being able to direct benefits to supporters without facing the risk of bankruptcy is mainly related to “the soft budget constraint” (Sheshinski and Lopez-Calva, 1999). Bankruptcy has a very high political cost; so if the SOE is facing that risk, the government would bail it out by using the public budget. Governments cannot afford the burden of bankruptcy; they would do everything in their power to avoid it, at the expense of taxpayers’ welfare.

The second school of thoughts suggests that market structure, or the level of competition in a market, affects the performance of SOEs. A more competitive market pressures the public managers and increases their incentives to improve the performance and competitiveness of the SOEs by lowering its costs and enhancing the quality of the goods and services provided. (Bognetti and Obermann, 2008)

During the past two decades, a considerable assortment of empirical evidence on the performance of privatized firms has accumulated and most of them documented a significant increase in company performance following privatization.

Boubakri, Cosset and Guedhami (2008), analyze the impact of privatization on a group of 189 firms from 39 countries and from strategic industries that were privatized between 1984 and 2002. The authors report that privatization of SOEs improves the firms’ operating efficiency, profitability and capital expenditures.

D’ Souza and Megginson (1999), study the operating and financial performance of a panel of 85 companies headquartered in 28 countries and privatized between 1990 and 1996. The results suggest significant increases profitability, operating efficiency, sales level, significant decreases in leverage and immaterial change in employment level and capital expenditures.
Andres, Foster and Guash (2006), investigate the effect of the privatization of 116 electricity companies in ten countries in Latin America. The results reveal that private ownership leads to significant improvements in efficiency, labor productivity, and product or service quality. The authors report that most of these improvements occur during the transition period, while the effect in the post transition period is much more modest.

Boubakri and Cosset (1998) investigate the pre-privatization and post-privatization operating and financial performance of 79 different companies headquartered in 21 developing countries (including countries identified as low-income economies, lower-middle-income economies and upper-middle-income economies), and which undergone full or partial privatization during the period going from 1980 to 1992. Moreover, to isolate the effect of privatization form the impact of other economic factors, the authors used adjusted performance measures. The authors present strong evidence that privatization results in significant increases in efficiency, profitability, capital expenditures, output, dividends and employment level and a decline in leverage.

La Porta and López-de-Silanes (1997) examine the change in the performance following privatization of 218 companies located in Mexico, between 1993 and the average of the four years preceding privatization. The study finds remarkable improvement in the performance of the privatized firms.

Megginson, Nash and Van Radeborgh (1994), examine the pre-privatization and post-privatization operating and financial performance of 61 firms headquartered in 18 countries and from 32 different industries experiencing full or partial privatization through Share Issue Privatization over the period from 1961 to 1990. The authors document that the firms after being privatized, “increase real sales, become more
profitable, increase their capital investment spending, improve their operating efficiency, and increase their work forces. Furthermore, these companies significantly lower their debt levels and increase dividend payout.”

Finally, D’Souza et al (2000), investigate the pre-privatization and post-privatization operating and financial performance of 26 telecommunication industries headquartered in 21 countries experiencing full or partial privatization through Share Issue Privatization over the period from 1984 to 1997. The results reveal that private ownership leads to significant improvements in efficiency, profitability, capital expenditure and average salary per employee while leverage decreases significantly.

2. Impact on Government Fiscal Conditions

One of the main drivers behind privatization is the fiscal pressure that governments were facing, to reduce the burden of loss-making SOEs, to reduce their budget deficits or to raise revenue for financing needs (Shehadi, 2002). It is worth mentioning that the International Monetary Fund (IMF) and the World Bank clearly state in their “Guidelines for Public Debt Management” that governments should use privatization proceeds to reduce public debt and to enhance fiscal stability (Boone and Goeree, 2009). In fact, countries of the European Union particularly included privatization in their economic reforms to reduce deficits and public debt.

A study by Barnett (2000) which examines the relationship between privatization and the different measures of fiscal and macroeconomic performance reveals that the proceeds generated from privatization and that were transferred to the budget, tend to be saved and not spent. Therefore privatization revenues combined with
proper fiscal measures (increasing revenues and decreasing expenditures) contribute to eliminating budgetary deficits.

According to Shehadi (2002), there is a frequent misconception that proceeds from privatization will create a once and for all increase in revenues. Critics against privatization compared it to selling the family silver or the crown jewels. While the fact that privatization proceeds are not recurring is true, privatization can produce recurring revenues for the government. Privatization increases revenues from taxes, since the SOEs is now owned by the private sector and is subject to corporate taxes. Moreover, according to Sheshinski et al (1999), privatization proceeds by reducing public debt will consequently decrease interest payments increasing by that the cash flow position of the state.

3. Impact on Capital Market Development

Privatization programs had an important impact on the development of capital markets particularly when it is done through Share Issue Privatization (SIP). Moreover, privatization also increased the participation of investors (individual and institutional) in the capital markets. (Megginson and Bouchkova, 2000)

Table 2 describes the growth in the total market capitalization on the world's stock exchanges (America, Asia - Pacific, Europe - Africa - Middle East) from 1990 to 2007. Total market capitalization increased at a compounded growth rate (CAGR) of 12.2% between 1990 and 2007.
Table 2: Global Market Capitalization, 1999-2007

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</thead>
<tbody>
<tr>
<td>Americas</td>
<td>3,417.5</td>
<td>4,547.8</td>
<td>4,982.7</td>
<td>5,028.0</td>
<td>5,775.6</td>
<td>7,644.2</td>
<td>9,385.6</td>
<td>11,857.1</td>
<td>13,552.5</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>3,456.5</td>
<td>3,777.2</td>
<td>3,073.5</td>
<td>4,408.5</td>
<td>5,103.6</td>
<td>5,121.3</td>
<td>4,950.4</td>
<td>3,513.9</td>
<td>3,796.4</td>
</tr>
<tr>
<td>Europe - Africa - Middle East</td>
<td>2,318.4</td>
<td>2,253.6</td>
<td>2,057.4</td>
<td>2,711.2</td>
<td>3,624.6</td>
<td>4,356.1</td>
<td>5,103.5</td>
<td>5,180.1</td>
<td>5,086.3</td>
</tr>
</tbody>
</table>

Source: www.world-exchanges.org

4. Impact on Employment

State Owned Enterprises which are usually protected from competition, tend to be overstaffed, often pay excessive wages and are governed by restrictive labor contracts. In many cases, these characteristics resulted in low productivity for the SOE and large labor costs. As mentioned before, SOEs were a medium to job creation for political supporters and to patronage. Restrictive labor contracts “place restrictions on the right of employers to hire and fire… and…allocate work… contributing not only to increased of doing business but also to high rates of absenteeism and moonlighting” (Kikeri, 1998)

Policymakers have traditionally feared and were concerned about massive layoff when privatization occurs. However, the impact of privatization on labor is complex and a large number of factors should be taken into consideration. According to Gupta et al
three possible outcomes could affect labor after privatization. The level of employment could follow a U-curve (figure 4) an L-curve (figure 5) or could decrease continuously (figure 6). The privatization process is divided into three periods: the pre-privatization period, the privatization period and the post-privatization period. In the pre-privatization period, SOEs usually carry out labor reforms as part of the restructuring process explaining the large employment reductions during this period in the three different graphs. Under the first method, while privatization resulted in a decrease in employment levels during the first two periods, the trend goes back up in the third period. The rationale behind this increase is that privatization has created new jobs. Several studies documented large increase in employment levels after privatization (Megginson et al 1996, Boubakri and Cosset 1996 and Galal et al 1994).

Fig. 4 Privatization Effect on Labor – Optimistic Scenario
Source: Adapted from Gupta et al (2001)
Some enterprises are not viable unless they reduce their workforce permanently (figure 5).

The third case represents the SOEs that are not viable even after restructuring process. The enterprises will be liquidated and all workers will be laid off.

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**Fig. 5 Privatization Effect on Labor – Permanent Job Losses**  
*Source:* Adapted from Gupta et al (2001)

**Fig. 6 Privatization Effect on Labor – Nonviable Enterprises**  
*Source:* Adapted from Gupta et al (2001)
Gupta et al. (2001) also argue that privatization effects on labor are different under the various privatization methods (table 3).

### Table 3: Impact of Privatization on Employments under the Different Privatization Methods

<table>
<thead>
<tr>
<th>Privatization Method</th>
<th>Short run</th>
<th>Medium to Long Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Sales/Auctions and Sales to Strategic Investors</td>
<td>Restructuring to make company profitable</td>
<td>Efficiency gains and overall economic improvement and hence, employment increase</td>
</tr>
<tr>
<td>Management/Employee Buyouts</td>
<td>No fresh capital or ideas and thus minimal effect on employment</td>
<td>Macroeconomic environment cushions adverse labor incidence that occurs gradually and hence employment increase/maintain</td>
</tr>
<tr>
<td>Management Contracts</td>
<td>Minimal impact on employment as contractor earns fixed fee</td>
<td></td>
</tr>
<tr>
<td>Lease Contracts</td>
<td>Incentive to cut down on work force as lessor keeps extra proceeds net of lease payment</td>
<td></td>
</tr>
<tr>
<td>Mass Privatization</td>
<td>Effect on employment depends on concentration of shareholding structure</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted by Shehadi (2001) from Gupta et al. (2001)

According to Kikeri (1998), several restructuring options can reduce labor resistance and make privatization possible:

- Early retirement and voluntary departure programs: this method is the most frequently used by governments to downsize the labor force. Voluntary departures were initiated by paying severance pay packages exceeding the minimum required by the law.
- Contracting arrangements: employees that were laid off during restructuring of SOEs usually join private cooperatives that compete with the private sector. Governments usually contract activities to private cooperatives to minimize labor redundancies.
Retrenchment: In many cases, employees resist voluntary departure programs. In that case, governments declare them “redundant on the basis of performance” and then lay them off with a separation package. This restructuring option is the most difficult one mainly on the political level.

5. Impact on Poverty

Estache et al (2001) divide the effects of privatization on the poverty into macroeconomic linkages and microeconomic linkages.

Macroeconomic linkages include: Economic growth, reduction in employment and reallocation of public expenditures. They are summarized in table 4.

Table 4: Macroeconomic Linkages between Privatization and Poverty

<table>
<thead>
<tr>
<th>Macroeconomic effect</th>
<th>Expected negative impact</th>
<th>Ameliorating factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>May result in difficult transition as a result of tariff rebalancing and service mix</td>
<td>Over the medium to longer run, increased private sector participation in infrastructure should contribute to growth which in turn tends to reduce poverty levels</td>
</tr>
<tr>
<td></td>
<td>changes (more or less standardization) which does not address the needs of the poor, in particular when there are no safety nets in place</td>
<td></td>
</tr>
<tr>
<td>Reduction in employment</td>
<td>Workforce often reduced soon after privatization</td>
<td>Depends to what extent poor households were employed by public enterprises and on the nature of the compensation provided to workers laid off</td>
</tr>
<tr>
<td></td>
<td>Wages may also decrease for some of the workers during a transition period</td>
<td></td>
</tr>
<tr>
<td>Reallocation of public</td>
<td>Reduction in overall subsidy allocation during transition as a result of fiscal</td>
<td>Privatization revenue and better targeting may ease financing of the needs of the real poor</td>
</tr>
<tr>
<td>expenditure</td>
<td>adjustment may reflect lower priorities for privatized utilities</td>
<td></td>
</tr>
</tbody>
</table>


Microeconomic side effects of privatization include: The cost of increasing formality (discouragement of informal or illegal connection), the cost of tariff level or structure adjustment, he cost of increasing price of complements or substitutes (illegal
providers) and the cost of improvement in the quality of service. They are summarized in table 5.

Table 5: Microeconomic Linkages between Privatization and Poverty

<table>
<thead>
<tr>
<th>Side effects of privatization</th>
<th>Possible sources of increase in cost burden for the poor</th>
<th>Possible mitigating factors and welfare gains for the poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of increasing formality</td>
<td>Revenue collection and discouragement of informal connections are likely to be more effective and result in an increase in the effective price paid.</td>
<td>• A formal connection, even at a cost, may be a true aspiration of vulnerable households. • Safety likely to increase with the formalization of connections. • Informal connection may have been more expensive. • Reform can bring technology choices at lower costs.</td>
</tr>
<tr>
<td>The cost of tariff level adjustments</td>
<td>Average tariff levels can increase, due to cost recovery requirements and need to finance quality related investments.</td>
<td>• Increase in average tariffs depends on pre-reform price levels and the distribution of the benefits of private participation between stakeholders. • Reform can cut cost significantly enough through improvements in efficiency or new technologies.</td>
</tr>
<tr>
<td>The costs of tariff structure adjustments</td>
<td>Tariff structures likely to be reformed in ways that could increase the marginal tariff faced by a poor household.</td>
<td>• Competition likely to decrease average tariffs and may also compensate for any tariff rebalancing that affects the poor.</td>
</tr>
<tr>
<td>The costs of increasing the price of substitutes</td>
<td>Privatization may restrict access to some alternative services, especially if connection to public network is mandatory.</td>
<td>• Access to other types of alternative services will not be affected if foreseen in contracts. • Availability of communal services may increase as a result of privatization.</td>
</tr>
<tr>
<td>The costs of increasing the price of complements</td>
<td>The cost of obtaining a connection to public network is likely to increase substantially.</td>
<td>• The cost of obtaining other complementary equipment is likely to be unaffected by privatization, but will remain high.</td>
</tr>
<tr>
<td>The costs of improved quality of service</td>
<td>Quality of service likely to improve, but this may make network services unaffordable for the poor.</td>
<td>• There is considerable evidence showing that poor households are willing to pay reasonable amounts to improve quality of service.</td>
</tr>
</tbody>
</table>


D. Privatization’s Lessons

Lieberman and Kirkness (1998) identify a set of key lessons that should be applied to have a successful privatization. These lessons include:
• political commitment and support: Privatization is a process that is intensely political. Therefore political commitment and momentum is required to overcome obstacles that could come in the way of a successful privatization. These obstacles include opposition to privatization, bureaucratic inertia and lack of coordination between the different government agencies. (Shehadi, 2002)

• transparency in the privatization program: the privatization process is susceptible to corruption. Corruption is defined by Kaufmann and Siegelbaum (1997) as “the abuse of official power for private gain (financial payoff or equivalence in kind)”. According to Shleifer (1998), “in exchange for campaign contributions or bribes, politicians may award contracts or sell whole firms to inefficient providers, overpay these providers, fail to make them accountable for quality, and even fail to enforce those contracts”.

• a favorable and clear legal framework: key legislation should include: Accounting rules, Bankruptcy law, Company law, Financial law, Foreign Exchange law, Foreign Investment law, Import/Export law, Intellectual property rights law, International law, Public procurement law and regulations on transfer of liabilities (Shehadi, 2002).

• a clear and detailed strategy for privatization: Every step of the privatization process should be considered carefully. Welch and Fremond (1998) divide the privatization process into five steps: Identification of privatization candidates, Feasibility Study, Privatization plan, Legislation or executive order and finally sale (Figures 7 & 8).

• liberalization and creation of a competitive environment before privatization: According to Shehadi (2002), vertical and horizontal unbundling of a sector is necessary to promote competition especially in infrastructure services (this issue will be analyzed
in details in section of this report). “Horizontal unbundling separates the sector into competing entities in the same market segment… while... vertical unbundling separates the sector into various components, each at a different stage of the value chain”.

- and finally establishment of an effective and fair regulatory framework: (this issue will be analyzed in details in section of this report). Regulation authorities should be fair and at equal distance from the different stakeholders. One of its main tasks promote competition and to block anti-competitive practices. They are also responsible for customers’ protection, assurance of uninterrupted services, conflict resolution, and resources management.

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**Fig. 7 Getting Ready for Privatization**

*Source:* Adapted from Welch and Fremond (1998)
E. Overview of Electricity Sector

Electricity or electric power is a vital input to most goods and services. People’s reliability and dependency on electricity grew over the years at an exponential rate. This growth was mainly due to increasing investments in sensitive electronics. Moreover and especially in developing countries, a reliable and adequate electricity supply was essential for international competitiveness, for domestic growth and for modernization. (Kessides, 2003)

Prior to the privatization wave that dominated the past two decades, the electricity utility was a vertically integrated monopoly of different main activities: electricity generation, high-tension transmission, system operation, low-voltage distribution, and supply (wholesale and retail).
Generation is defined as the generation of electric power through a variety of technologies and renewable & nonrenewable primary energy resources. Renewable energy resources include hydropower energy, solar thermal and photovoltaic energy, wind energy, biomass energy and geothermal energy. Nonrenewable energy resources include petroleum, natural gas, coal and uranium. (Kessides, 2003)

Transmission consists of the high tension grid or the “highway” used for transferring electricity from the generation sites to the main transformer stations. The transformer stations transform electricity from high voltage to medium and low voltage. And then, electricity is distributed through low and medium voltage wires and networks (the distribution network) to residences and businesses. (Kessides, 2003)

System operation is defined as the coordination of transmission services ensuring that the system is continuously in state of equilibrium, equaling electricity demand and supply at each and every node of the transmission grid. (Directive 96/92, 1997). According to Griffin and Puller (2005), “electricity has special physical characteristics that make electricity markets different from most other commodity markets. Electricity energy is injected into the transmission grid by all generators and withdrawn by all end users. … However, the injection and withdrawal of energy must be carefully regulated. Electricity can not be stored economically so the amount granted at every point must equal the amount consumed. … In effect, Adam Smith’s invisible hand is hardly invisible for electricity markets.” Therefore, a central coordinator is required.

Supply includes wholesale and retail functions. “Wholesale supply means sales for resale, that is, sales to distributing utilities and/or traders. Retail supply means sales to final consumers.” (Yajima, 1997) (Wholesale and retail supply will be discussed in
section H) Supply also includes power procurement, metering and billing, and it can comprise other activities such as customer information, advice and financing.

The activities of generation and supply are potentially competitive when the proper regulatory and market conditions are established. Supply has traditionally been bundled with distribution in markets with monopoly structure, but it can be performed separately. Transmission distribution and system operation are “natural monopolies” since it is not economically feasible to replicate them in order to provide end users with the choice of supplier. (Pritchard, 2003)

A simplified electric power sector model is illustrated in the following figure (fig. 9):

![Electric Power Sector Model](fig. 9)

**F. Driving Forces behind Electricity Reforms and Privatization**

A number of studies and reports described the driving forces behind electricity reforms and privatization. These driving factors could be summarized as follows:

- Poor performance of the electric utility & investment shortage: Sector problems in electricity in developing countries are most likely sensed by the customers through the “non-delivery of the product”. Power blackouts are the most dramatic
problems with the high cost of providing alternative supply of electricity. Moreover, quality of service, taking several forms can also deteriorate and may impact end-users adversely. This “failure of supply” can be associated with two main reasons: Low operating efficiency mainly caused by theft, lack of maintenance among other reasons; combined with investment shortage generated from financial restrictions. This inability of the government to finance new investments is mainly associated with low tariffs setting and which can not cover all of the costs of production (Bacon and Besant-Jones, 2001). Moreover, these financial problems impaired the ability of the public sector to expand its services in order to keep up with the mounting demand for power.

- The need to remove electricity subsidies in order to release funds for other more critical public expenditure needs (Bacon and Besant-Jones, 2001).
- The desire to raise instant returns for the public sector by selling some of the sector’s assets (Bacon and Besant-Jones, 2001).
- Rapid changes in technology: Recent technological advances are considerably changing the cost structure of electricity generation. Small-scale electricity generators which are more economical, affected the service landscape and especially in developing countries that lack regulatory functions or where there are no barriers to entry. Moreover these trends are also altering the transmission grid’s economic characteristics in addition to increasing the specter of competition. (Kessides, 2003)
- Pressure to reform by multilateral lenders like the International Monetary Fund (IMF), the World Bank, and others which inflect several challenging conditions on grants and loans. (Brown, 2003)
G. Electricity Deregulation

“Deregulation does not involve simply removing the existing regulatory infrastructure. Other regulatory institutions must be in place and market oversight is still required. In fact, many electricity economists eschew the term electricity deregulation, preferring instead ‘electricity restructuring’.” (Griffin and Puller, 2005)

Any deregulation process requires the establishment of a new regulatory framework having two major objectives:

- promoting competition in the activities that are potentially competitive (generation and supply of electricity)
- regulating and controlling the performance of the monopoly activities (power transmission, distribution and system operation).

1. Promotion of Competition in Potentially Competitive Activities

In order to promote competition in potentially competitive activities, mainly in generation and supply activities, restructuring of the sector (vertical and horizontal unbundling) is necessary, and barriers of entry to new entrants should be dismantled. As mentioned before, vertical unbundling, relates to the separation of the utility into several components. In the electricity case it refers to the separation of the activities of electricity generation, transmission, system operation, distribution and supply. Horizontal unbundling is defined as dividing each segment (generation, transmission, system operation, distribution and supply) into several competing entities. Moreover, regulation must ensure transparent and predictable mechanisms for entering in the sector.

However, development of competition needs not only to be established on the offer side but also on the demand side. Therefore, it is necessary to allow consumers, at
least some of them, to freely choose their energy supplier. This is known as the “opening of the market”. In this way, competition in supply is introduced on the demand side as well, creating pressure for lowering prices of energy. Most of the countries which opened their energy markets did it in a progressive manner. Thus, they started allowing some big consumers of energy to freely choose their supplier of energy. Those consumers are usually called “free consumers”, or “eligible consumers”. (directive 2003/54/EC, 2003). Those who cannot choose their supplier are “non-eligible consumers” or “captive consumers” and they are supplied with energy by the distribution company. In the last case, the distribution company performs not only distribution but also the activity of supply of energy to captive customers. Companies allowed to sell energy to “eligible consumers” may be, depending on the regulation of each country: specific supply companies (wholesalers, retailers, importers/exporters), production companies (generators of electricity and producers of gas), integrated distribution and supply companies, power exchanges, pools (for detailed information please refer to section H), and even foreign energy companies in the case of regionally integrated countries. (De Quita et al, 2000).

To sum it up, competition on the electricity market is possible only if: (IPP Msc Energy, 2004 and Zhang et al, 2002)

- vertical unbundling is introduced, meaning that the operator of the transmission and distribution networks will have no influence on the generator sector, through which cross-subsidies can be avoided;

- competition between generators is ensured. This requires the division or horizontal unbundling of the existing electricity generator, which would create
competition on the electricity market; the entry of new generator company into the market could be part of a solution introducing competition.

- a wholesale or retail market is created which includes both suppliers and consumers, the central aim being the opening of the market;
- a regulatory authority is established to ensure non-discriminatory access to and use of transmission and distribution networks. All electricity suppliers should be given equal opportunity in selling electricity to the consumer. The transmission and distribution of such via the networks must not distort competition.

2. Regulation and Control of Natural Monopolies

The second goal that should be achieved in an open market is to regulate and control network activities, transmission and distribution.

Because of the large economies of scale of transmission and distribution, they are usually considered “natural monopolies”. In other terms, “a natural monopoly is simply the case where a single firm can produce the total market output at a lower cost than can a collection of individual competitive firms”. (Griffin and Puller, 2005) Then, as these activities are performed under monopoly conditions, they need to be regulated, particularly establishing technical and economic conditions of access to the networks.

There are diverse systems of third party access (single buyer, wholesale competition and retail competition which includes regulated third party access, negotiated third party access and pool). (The different types of third party access will be discussed in section H). Usually the laws establish the principles and general rules about access, and regulations detail the implementation rules.
In this regard, the regulation must be addressed to avoid abuses of dominant position and, in particular, to ensure:

- fair tariffs for network activities,
- quality of service for consumers and users of the networks,
- non-discriminatory access to the transmission and distribution networks.

Therefore, some of the major tasks of the authorities are to set tariffs and to establish appropriate standards for quality of service. They also have to control that companies performing activities under monopoly conditions comply with the obligations established in the licenses, in the laws and in the regulation, applying sanctions in cases of non-compliance. This is one of the main tools to protect consumers’ rights and to allow free trade of energy.

H. Electricity Deregulation and Privatization models

Four different models for the structure of electricity market can be identified (Figure 10). These different structures involve varying degrees of competition and customer choice (table 6). Models 2, 3 and four are referred to as third party access. (Bacon and Besant-Jones, 2001, Kessides, 2003 and Brendow 2001):

- **Model 1: Monopoly**: This model represents the traditional status quo; it involves no competition at all, instead it only involves monopoly on all the levels of the electricity supply chain. A single entity (monopolist) produces and delivers electricity through the transmission network to the final users.

- **Model 2: Single Buyer**: In this model, the traditional monopolies have been vertically unbundled. However, horizontal unbundling is only at the generation level. A single purchasing agency, the single buyer, chooses its sources of electricity from
different competing generators. The agency having a monopoly on the transmission networks sells then electricity to distribution companies and large power users without competition from other suppliers.

- **Model 3: Wholesale competition**: In this model distribution companies can chose the generators they wish to purchase electricity from and then they transmit this electricity through the transmission network to their service areas and keep a monopoly over electricity sales to final customers.

- **Model 4: Retail competition**: This model allows all customers to buy electricity from generators either directly or from retailers of their choice; suppliers having open access on the distribution and transmission networks. This model can be divided into three different types:
  
  - **Negotiated Third Party Access**: Under Negotiated TPA (nTPA), producers and consumers of electricity will contract supplies directly with one another, and then they will negotiate access to the transmission and distribution networks with its operator. Such negotiations will deal with transport tariffs. Moreover, to promote transparency, average access prices over the past year as an indicative price and a guide for potential new entrants. (Bergman et al, 1999)

  - **Regulated Third Party Access**: Under Regulated TPA (rTPA), producers and consumers will also contract supplies directly with one another. However, the price for the use of the transmission and distribution networks can not be negotiated. The eligible customers have a right of access on the basis of published tariffs. (Bergman et al, 1999)
- Pool (or market, exchange): The pool model is a combination of access rules to transmission network and a competitive market in which demand and supply determine prices at the electricity generation and supply. Deregulation and Privatization programs of electricity utilities are usually designed to move along these four models, starting from model 1 the status quo and progressing through model 2 which is the most conservative privatization model and model 3 until reaching model 4 which is the most radical privatization model, and which has not been extensively implemented outside a few developed countries. Models 2, 3 and 4 have the potential to progressively introduce more decision making and competition to the electricity industry. However, the question of whether model 2 is a reasonable transition to model 3 and at what stage model 4 is feasible or appropriate for a certain country is an extremely complex policy decision having many important dimensions and risks.

Fig. 10 Four Models of the Structure of Electricity Market
Table 6: Summary Characteristics of the Models of Electricity Market

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(a) Monopoly</th>
<th>(b) Single Buyer</th>
<th>(c) Wholesale competition</th>
<th>(d) Retail competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Monopoly at all levels</td>
<td>Competition in generation - single buyer</td>
<td>Competition in generation: choice for distribution companies</td>
<td>Competition in generation: choice for final consumer</td>
</tr>
<tr>
<td>Competing generators?</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Choice for retailers?</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Choice for final consumers?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

CHAPTER III

ELECTRICITE DU LIBAN CURRENT SITUATION

A. Historical Overview of Electricité du Liban (EDL)

Before 1954, electricity in Lebanon was in the hands of the private sector. In fact, the use of electric power started in Lebanon during the Ottoman era. In 1886, the “Ottoman authority” granted a concession to the private sector, giving them the right to manage and operate the Lebanese electric power sector. However, it retained some control over the sector through a concession contract that includes terms and conditions of this delegation of power as well as the rights and the obligations of the private sector or the service provider. (Shehadi, 2002)

Between 1886 and 1954, four generation concessions, 28 distribution concessions and one transmission concession were created. One of these concessions a joint stock company called “Tramways et Eclairage de Beyrouth” was formed on January 3, 1923. This company was handling the Ottoman concessions in the transportation and electric power sectors. The company’s name was subsequently changed to “Electricity of Beirut”. (Baroudi, 1999)

In 1954, and at the close of World War II, many problems faced the electricity sector in Lebanon. The concessions failed to generate the power balance load demand, electricity cuts were frequent. The Lebanese Government forced “Electricity of Beirut”, to increase gradually their installed capacity to put it at the disposal of the subscribers, thus increasing the tariff levels. The increase in tariffs led to many strikes, street riots and manifestations, and the subscribers stopped paying their consumption bills for many months. (Abisaid, 2008) As a result, the government recuperated the concession granted
to “Electricity of Beirut” on July 2, 1954, and promulgated on July 7, 1954 the law establishing the “Electricity and Common Transport Department” a unified department set to handle all matters related to both transport and electricity. Surprisingly enough, following this nationalization, the public sector was able to redress the poor situation in a very short period. (Baroudi, 1999)

It took seven years, exactly on April 14, 1961 for the government to separate the Electricity Department from the Common Transport Department, and each department specialized in its related affairs.

Finally, on July 10, 1964, the legislative decree N° 16878 was adopted and created the present “Electricité du Liban” or EDL.

After reaching acceptable standards in 1974, the electricity sector suffered serious damages during 1975 - 1990 civil war. EDL witnessed a gradual deterioration of the quality of service and capacity of load supply. (Abisaid, 2008) This fall back was a major handicap in the face of economic upheaval. The rehabilitation and expansion project of the electricity network started at the end of 1993, in order to rehabilitate and expand the generation, transportation and distribution sectors.

Currently, EDL is a vertical integrated utility and is responsible for all electric power generation, transmission, distribution and supply activities and is functioning as a National monopoly. Furthermore, EDL is under the administrative Tutelage of the Ministry of Energy and Water (MEW), which is responsible for policy formulation of the power sector.

B. Mission Statement of Electricité du Liban (EDL)

“The mission of Electricité du Liban (EDL) is to generate, transmit, and distribute electricity to all Lebanese territories up to the highest possible quality
standards and in compliance with the laws and regulations of the Lebanese Republic.” (EDL website)

C. Vision of Electricité du Liban (EDL)

“EDL strives to play a beneficial and constructive role in supporting and promoting economical growth and social development in Lebanon and is strongly committed to offering all its customers fast, dependable, and courteous services in a transparent manner.” (EDL website)

D. Internal environment

1. Structure

a. Generation

Lebanon’s energy generation facilities (tables 7 & 8) are spread all over the Lebanese territory (figure 11). They include seven thermal power plants of which six are owned by EDL and one owned by Kadisha concession (concession was purchased by EDL in 1995) and fifteen hydraulic power plants of which two are owned by EDL and four owned by Kadisha concession.

Table 7: Thermal Power Plants in Lebanon

<table>
<thead>
<tr>
<th>Thermal Power Plants</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zouk (fuel oil)</td>
<td>EDL</td>
</tr>
<tr>
<td>Jieh (fuel oil)</td>
<td>EDL</td>
</tr>
<tr>
<td>Hrayche (fuel oil)</td>
<td>Kadicha</td>
</tr>
<tr>
<td>Deir Ammar (combined cycle)</td>
<td>EDL</td>
</tr>
<tr>
<td>Zahrai (combined cycle)</td>
<td>EDL</td>
</tr>
<tr>
<td>Baalbek (gas oil)</td>
<td>EDL</td>
</tr>
<tr>
<td>Sour (gas oil)</td>
<td>EDL</td>
</tr>
</tbody>
</table>

Source: Electricité du Liban
Zouk (largest power plant) and Jieh are the oldest operating plants among EDL plants.

Table 8: Hydraulic Power Plants in Lebanon

<table>
<thead>
<tr>
<th>Hydraulic Power Plants</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awali (Paul Arache)</td>
<td>Litani River Authority</td>
</tr>
<tr>
<td>Joun (Charles Helou)</td>
<td>Litani River Authority</td>
</tr>
<tr>
<td>Markabi (Abd el Aal)</td>
<td>Litani River Authority</td>
</tr>
<tr>
<td>Blouza</td>
<td>Kadisha</td>
</tr>
<tr>
<td>Abou Ali (2 power plants)</td>
<td>Kadisha</td>
</tr>
<tr>
<td>Mar Licha</td>
<td>Kadisha</td>
</tr>
<tr>
<td>Bcharre</td>
<td>Kadisha</td>
</tr>
<tr>
<td>Naher Ibrahim (3 power plants)</td>
<td>private</td>
</tr>
<tr>
<td>Bared (2 power plants)</td>
<td>private</td>
</tr>
<tr>
<td>Wadi el Arayech</td>
<td>EDL</td>
</tr>
<tr>
<td>Safa</td>
<td>EDL</td>
</tr>
</tbody>
</table>

Source: Electricite du Liban

Fig. 11: Map of EDL Generation Locations
Source: Electricite du Liban
The total generating installed capacity (capacity at commissioning) is estimated at 2,320 MW, of which 1,977 MW is in EDL and 101 MW is in Kadisha (owned by EDL). However, available supply has been drastically reduced in the past few years due to several major events (World Bank Report) that will be discussed in the technical problems section. As a result, available capacity (actual capacity taking into consideration the technical losses that occur) is estimated as low as 2,149 MW, of which 1,834 MW is in EDL (table 9) and 45 MW in Kadisha, as at 13.02.09.

The total electricity generated reached 9,400 GWh in 2007 and 4,814 GWh during the first half of 2008.

Table 9: Capacity of Power Plants in Lebanon

<table>
<thead>
<tr>
<th>Plant</th>
<th>Installed Capacity (MW)</th>
<th>Available Capacity in 2004 (MW)</th>
<th>Available Capacity current (MW)</th>
<th>Generation 2007 (GWh)</th>
<th>Generation 6m 2008 (GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zouk</td>
<td>607</td>
<td>520</td>
<td>341</td>
<td>2,146</td>
<td>1,036</td>
</tr>
<tr>
<td>Jich</td>
<td>346</td>
<td>295</td>
<td>223</td>
<td>1,306</td>
<td>642</td>
</tr>
<tr>
<td>Der-Ammar</td>
<td>435</td>
<td>435</td>
<td>290</td>
<td>1,967</td>
<td>1,549</td>
</tr>
<tr>
<td>Zahrani</td>
<td>435</td>
<td>425</td>
<td>190</td>
<td>2,718</td>
<td>1,166</td>
</tr>
<tr>
<td>Baalbeck</td>
<td>70</td>
<td>70</td>
<td>60</td>
<td>396</td>
<td>102</td>
</tr>
<tr>
<td>Tyr</td>
<td>70</td>
<td>70</td>
<td>60</td>
<td>147</td>
<td>78</td>
</tr>
<tr>
<td>Richmaya</td>
<td>14</td>
<td>9</td>
<td>7</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total EDL</strong></td>
<td><strong>1,977</strong></td>
<td><strong>1,834</strong></td>
<td><strong>1,171</strong></td>
<td><strong>8,698</strong></td>
<td><strong>4,585</strong></td>
</tr>
<tr>
<td>Kadisha (Hydraulic + Thermal)</td>
<td>101</td>
<td>80</td>
<td>45</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>Litani</td>
<td>192</td>
<td>190</td>
<td>0</td>
<td>550</td>
<td>134</td>
</tr>
<tr>
<td>Ibrahim, Bareid &amp; Zahle</td>
<td>51</td>
<td>45</td>
<td>26</td>
<td>118</td>
<td>81</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>2,320</strong></td>
<td><strong>2,149</strong></td>
<td><strong>1,242</strong></td>
<td><strong>9,400</strong></td>
<td><strong>4,814</strong></td>
</tr>
</tbody>
</table>

*Source: Electricite du Liban*
b. Transmission

Electricité du Liban transmission network include Over Head Transmission Lines ("OHTL"), underground cables lines and Substation (SS) (transformer stations) that operate at three different voltage levels – 220 KV, 150 KV and 66 KV.

The following two tables (tables 9 & 10) provide details on (i) EDL’s transmission networks at different voltage level as well as (ii) the private utilities transmission networks (66 KV):

Table 10: EDL’s Transmission Network at Different Voltage Levels

<table>
<thead>
<tr>
<th>Voltage (KV)</th>
<th>Description of the Cables</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>320</td>
<td>OHTL</td>
<td>191</td>
</tr>
<tr>
<td>220</td>
<td>Underground</td>
<td>37</td>
</tr>
<tr>
<td>130</td>
<td>OHTL</td>
<td>163</td>
</tr>
<tr>
<td>150</td>
<td>Underground</td>
<td>28</td>
</tr>
<tr>
<td>66</td>
<td>OHTL</td>
<td>665</td>
</tr>
<tr>
<td>66</td>
<td>Underground</td>
<td>59</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1,143</strong></td>
</tr>
</tbody>
</table>

*Source: Electricité du Liban*

Table 11: Private Utilities’ Transmission Network

<table>
<thead>
<tr>
<th>Description – Transmission lines</th>
<th>Voltage (kV)</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kadisha</td>
<td>66</td>
<td>96.7</td>
</tr>
<tr>
<td>Office National du Litani</td>
<td>66</td>
<td>69.5</td>
</tr>
<tr>
<td>Nahr Ibrahim</td>
<td>66</td>
<td>13.6</td>
</tr>
<tr>
<td>Bared</td>
<td>66</td>
<td>38</td>
</tr>
</tbody>
</table>

*Source: Electricité du Liban*

Note: Kadisha and Office National du Litani are respectively owned by EDL and by the State
c. Distribution

The distribution system in Lebanon is divided into 7 “mantaqa” or main areas. Each “mantaqa” is divided into several “dayra” or districts. Each and every mantaqa and dayra have their local EDL offices, located in the main towns. The management staff in these offices have the following responsibilities:

- overall coordination of the mantaqa/dayra
- Customers’ billing and control of payments
- Operation and Maintenance
- Reporting to the distribution directorate located in the head office in Beirut.

The distribution system extends from the Medium voltage (MV) cables terminations (distribution cables) to the customer meter.

Currently, Distribution system in EDL consists of four Medium voltage (MV) levels: 5.5KV, 11KV, 15 KV, 20 KV. The 20 KV network (nominal 24 KV) is gradually replacing the 5.5, 11 and 15 KV networks.

- The 5.5 KV network is limited. This voltage is only fed to a few distribution posts.
- The 11 KV and 20 KV Medium Voltage levels are mainly present in the capital Beirut
- The 15KV level is present in the rest of the country.

Since 1999, EDL has been rehabilitating its distribution system. One of the targets of the rehabilitation program was to implement a single MV voltage level, and to abandon the other voltage levels, for economic and technical considerations. EDL chose to convert the MV distribution system to the 24 KV nominal level.
d. Technical Problems

During the civil war, the Lebanese generation, distribution and transmission systems were severely damaged. The electric power system as a whole was more or less abandoned and neglected by the operators who were not able to provide necessary maintenance (lack of preventive inspection and repair, shortage of spare parts).

Overhead lines and underground cables were severely damaged if not completely destroyed (mainly the case in the deserted villages). Regular service connections were damaged or removed, resulting in numerous illegal electrical connections.

In spite of EDL’s efforts that were undertaken since 1992 for rehabilitating the Lebanese Electric Power Sector, the main focus was on rehabilitating and expanding the power stations while little attention was given to the transmission network. This made the electricity distribution difficult in several regions (mainly in the Bekaa and the North) despite EDL’s large potential of production at that time.

Nevertheless, Lebanon’s electricity supply was drastically reduced in the past few years due to a number of issues:

- Deir Ammar and Zahrani power plants were designed as gas-based combined cycle plants functioning on natural gas. However, gas oil is currently used as fuel in these two power plants, which is more costly and technically less suitable compared to natural gas. Now these power stations can only produce 75% of their nominal capacity. In 2003, a new gas law was promulgated for the designing, financing, development and construction of refineries, LNG (Liquid natural gas) terminal and natural gas network and storage were envisaged but not officially ratified. However, the law was not applied and only a part of the gas pipelines were built (only one coastal
pipeline extending from across the Syrian border to Deir Ammar in the North) as a part of the agreement with the Syrian Government to supply natural gas from Syria.

- Jieh and Zouk (largest power plant) constructed respectively starting 1970 and 1984, are Lebanon’s oldest plants and their life span has come to its end. Moreover, they are overdue for overhaul.
  - the gas turbines at the Deir Ammar and Zahrani power plants require restoration;
  - “a fire at the Zouk Power Plant”; (World Bank, 2008)
  - “fuel supply problems due to the destruction of fuel tanks at the Jieh Power Plant during the hostilities with Israel in July 2006”; (World Bank, 2008)
  - The heavy damages received by the main load sent-out sub-station at Deir Ammar power plant due to bombardment by Israel during the July 2006 hostilities;
  - and most recently, damages incurred by the Deir Ammar power plant during the fighting in the area of the “Nahr El-Bared” Camp (World Bank, 2008)

Therefore EDL was unable to meet to meet demand effectively due to insufficient generation capacity, high levels of lost electricity (technical and non-technical) and poor load management. EDL was forced to purchase electricity from Syria (electric energy imported from Syria corresponded to 9.4% of total production in 2007 and 6.7% for the first semester of 2008) and to the rationing, which increased the use of back-up and self-generation by Lebanese people to satisfy their need for electricity (for more details refer to section E of this chapter).

Furthermore, troubleshooting or the diagnosis of the problem was very challenging making it hard to carry out any preventative maintenance. Troubleshooting problems were due to the following reasons: (IPP MSC Energy, 2003)
• Troubleshooting was based on employee knowledge of networks and word of mouth since there are no reliable as-built drawings.

• Lack of a central coordination to localize the problems due to the complete absence of operating diagrams and communication equipment

• Lack of time, tools and equipment compelling operators to make low-quality repairs having a high probability of repetitive failure.

During recent years, new projects were developed for the restructuring of the electricity sector. However, these projects experienced considerable delays in their implementation. To mention some:

• The transmission network 220 KV, enveloping the Lebanese territory, suffered (and is still) implementation delays in some of its trajectory, due to non-technical reasons.

• The transmission network (220 kV and 400 kV line connecting Ksara substation in the Bekaa to the Dimas substation in Syria), in spite of its urgency, is not completed due to problems of neglected building rights along parts of the lines.

• Delay in contracting and commissioning the National Control Center (NCC) or the system operation that could mitigate the effects of power plant outages and shortcomings in the transmission and distribution lines. The NCC carries out the complicated task of collecting effective and reliable data on electricity generation, transmission and distribution for the assessment electricity-demand and network load management. (It is worth mentioning that in March 2006, the Council for Development and Reconstruction awarded the NCC to a French firm after a bidding process. However, it has not been constructed yet and it is not expected to be completed before at least a couple of years).
2. Culture

Organizational culture in EDL is similar to the Lebanese culture and is based on the following (Issa, 1999):

- Confessionalism: hiring and promoting employees depends on the religious division per sect. This fact has hindered the progression of EDL as it has encountered employment problems where incapable people were placed in positions instead of highly qualified personnel, based solely upon their religious views.

- Personal allegiance: employees’ loyalty remains with the influential people which helped them being hired, and could help them evolve, rather than dedicating their loyalty to their company.

- Centralization: the Lebanese culture does not seem to encourage decentralization of power.

- Fear of responsibility and lack of accountability: EDL has become well-known for corruption and illegal “under-the table” deals, which despite all the efforts and incessant interventions of “the Inspection” and the judicial authorities, are barely put to end. This situation has made it rather impossible for anyone in EDL to be liable for any action or decision made. This was the primary reason why they would rather shift this responsibility to the higher ranked employee such as the General Manager, and from there to the Council of Ministers.

- Absence of motivation, especially in the public sector.

- The "Culture of Waste", which characterizes the Lebanese society.

3. Organizational Structure

EDL today is headed by a Board of Directors and a General Director.
EDL’s board of directors has eight members appointed by the government, including one government representative. The Board meets on a weekly basis or upon need. The Board powers were described in a decree (No. 4517 dated 13 December 1972) applicable to all state owned enterprises. The powers are broad and they include the formulation of EDL (the company) policy, personnel laws, as well as the approval of tariffs, budgets, work programs, and significant contracts (above LBP 200 million or around US$ 135 thousand). Decision making of the BOD is based on voting. The Board members are appointed by the Council of Ministers; however, they are not independent. Their appointment is based on political interference and confessional affiliations in the country.

Ten directorates share the whole range of tasks of EDL. Four (4) of them are in charge of the technical operations of the Institution: generation (production), transmission and distribution (2 directorates, including the supply functions at a time). The other directorates perform administrative, support or service tasks.

![Organization Chart of EDL](electricite-du-liban.org). Source: Electricité du Liban
4. Management

EDL’s choice in management also mirrors the Lebanese reality based on political interference, such as the appointment of incompetent and misplaced managers trying to balance and avoid any political fractions between the different parties in power.

Such inconsistency in the formation of the Management team as well as the shortage of competent middle managers causes significant lack of delegation of duties and responsibilities, whereas the Manager is often submerged with routine operational tasks and problems and therefore cannot focus on the strategic tasks.

Mobility within the enterprise is quite limited and it is nearly impossible for managers to rotate between several management positions. (Ernst and Young, 1995)

Within EDL decision making is centralized. Decisions are made and initiatives are driven following the “top down approach”. The management team determines the approach that should be taken and then disseminates it to the employees or lower levels in the organizational hierarchy.

5. People

EDL employs approximately 2047 full-time employees as of end January 2009, most of which have been with the SOE for many years. In addition, there are about 1,800 short-term contract employees. The average age of the long-term employees in EDL is about 58 years (table 12) reflecting the freeze on hiring new personnel. In fact to avoid abuse of personnel recruitment, the government halted all kinds of new recruitment since 1985, unless approved by the Council of Ministers As a result, about 100 to 120 people reach retirement age every year at EDL and more than 55% of current employees will go on retirement within next 10 years.
However, five exceptions relative to the freeze on new employment were recorded:

- In 1988: 114 were recruited for the Jieh and Zouk power plants
- In 1995: 62 handicapped were employed
- In 1996: 50 engineers were employed of whom less than 15 remained at EDL
- In 2003: 30 engineers were employed
- In 2007: 32 engineers were employed
- In 2009, about 120 staff were employed

Moreover lately, contracts (some with exorbitant salaries) seem to be multiplying with some being paid from ministries budgets and some charged to internationally funded projects.

Table 12: Breakdown of the EDL Fixed Personnel by Age Bracket as at end January 2009:

<table>
<thead>
<tr>
<th>Employees Age</th>
<th>Fixed employees</th>
<th>Temporary employees</th>
<th>Contractual employees</th>
<th>Total</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30 yrs</td>
<td>162</td>
<td>0</td>
<td>0</td>
<td>162</td>
<td>8%</td>
</tr>
<tr>
<td>31-40 yrs</td>
<td>130</td>
<td>1</td>
<td>1</td>
<td>132</td>
<td>6%</td>
</tr>
<tr>
<td>41-50 yrs</td>
<td>464</td>
<td>3</td>
<td>7</td>
<td>474</td>
<td>23%</td>
</tr>
<tr>
<td>51-60 yrs</td>
<td>727</td>
<td>3</td>
<td>8</td>
<td>738</td>
<td>36%</td>
</tr>
<tr>
<td>&gt; 60 yrs</td>
<td>536</td>
<td>2</td>
<td>3</td>
<td>541</td>
<td>26%</td>
</tr>
<tr>
<td>Total</td>
<td>2,019</td>
<td>9</td>
<td>19</td>
<td>2,047</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Electricite du Liban

EDL personnel are classified into six categories: (Abisaid and Baroudi, 2001)

- Category 1/1: General Manager
- Category 2/1: Directors
- Category 2/2: Managers
• Category 3: Engineers and university graduates
• Category 4: assistant engineers and high grade technicians
• Categories 5 & 6: Simple technicians, workers, collectors and low level staff.

Table 13: Breakdown of the EDL Fixed Personnel by Grade as at end January 2009:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Technical Staff</th>
<th>Administrative Staff</th>
<th>Total Staff</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0.1%</td>
</tr>
<tr>
<td>2/2</td>
<td>8</td>
<td>2</td>
<td>10</td>
<td>0.5%</td>
</tr>
<tr>
<td>3/1</td>
<td>14</td>
<td>20</td>
<td>34</td>
<td>1.7%</td>
</tr>
<tr>
<td>5/2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>3/2</td>
<td>115</td>
<td>66</td>
<td>181</td>
<td>8.8%</td>
</tr>
<tr>
<td>3/B2</td>
<td>40</td>
<td>7</td>
<td>47</td>
<td>2.3%</td>
</tr>
<tr>
<td>4/1</td>
<td>462</td>
<td>165</td>
<td>627</td>
<td>30.8%</td>
</tr>
<tr>
<td>4/2</td>
<td>328</td>
<td>2</td>
<td>330</td>
<td>16.1%</td>
</tr>
<tr>
<td>5/1</td>
<td>474</td>
<td>214</td>
<td>688</td>
<td>33.6%</td>
</tr>
<tr>
<td>5/2</td>
<td>95</td>
<td>2</td>
<td>71</td>
<td>3.5%</td>
</tr>
<tr>
<td>6/1</td>
<td>2</td>
<td>48</td>
<td>50</td>
<td>2.4%</td>
</tr>
<tr>
<td>6/2</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>0.3%</td>
</tr>
<tr>
<td>Total</td>
<td>1,515</td>
<td>532</td>
<td>2,047</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Electricite du Liban

The unified remuneration scale for the different categories of official functions in the various ministries, with a few exceptions, poses obstacles for the capacity building of EDL existing staff. These obstacles are faced by all ministries and cannot be overcome, at least in the foreseeable future. The government’s financial situation is in no position to review the remuneration scale and subject it to variable market supply-demand conditions. In the absence of motivation (mainly increases in salaries and compensations), existing staff would be reluctant to improve their work efficiency and performance.

On the other hand, qualified personnel would shy away from joining EDL (if the employment freeze stops) as long as the remuneration scale falls short of the market scale.
6. Financials

As a business establishment, EDL would be bankrupt, unable to pay its debt or even to finance its operations. Business results and financial performance of EDL are assessed through a table of financial indicators (audited) for the years 1999, 2000 and 2001 (table 14), bearing in mind that the last audit was done for the financial year 2002, the report not being released to the public yet. Prior to the steep drop in world oil prices early in 2009, Finance Minister Mohammad Shatah pointed out that “EDL’s deficit is expected to reach US$ 2 billion in 2009, from nearly US$ 1.2 billion in 2007… EDL’s projected deficit will represent almost two-thirds of the government’s budget deficit. No country in the World has a case like that.” (Habib, 2008)

Table 14: EDL Financial Indicators (audited)

<table>
<thead>
<tr>
<th>Source: Electricite du Liban</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 14: EDL Financial Indicators (audited)</strong></td>
</tr>
<tr>
<td><strong>in millions of US$</strong></td>
</tr>
<tr>
<td>1999</td>
</tr>
<tr>
<td>A. CURRENT ASSETS</td>
</tr>
<tr>
<td>B. INVENTORIES</td>
</tr>
<tr>
<td>C. SALES</td>
</tr>
<tr>
<td>D. NET FIXED ASSETS</td>
</tr>
<tr>
<td>E. DEPRECIATION</td>
</tr>
<tr>
<td>F. TOTAL ASSETS</td>
</tr>
<tr>
<td>G. DEBTS</td>
</tr>
<tr>
<td>H. CURRENT LIABILITIES</td>
</tr>
<tr>
<td>I. NET INCOME</td>
</tr>
<tr>
<td>J. EQUITY</td>
</tr>
<tr>
<td>K. ACCOUNTS RECEIVABLE</td>
</tr>
<tr>
<td>L. CURRENT RATIO (A/H)</td>
</tr>
<tr>
<td>M. QUICK RATIO (A/B/H)</td>
</tr>
<tr>
<td>N. INVENTORY TURNOVER (C/B)</td>
</tr>
<tr>
<td>O. FIXED ASSETS TURNOVER (C/D)</td>
</tr>
<tr>
<td>P. TOTAL ASSETS TURNOVER (C/F)</td>
</tr>
<tr>
<td>Q. DEBT TO EQUITY</td>
</tr>
<tr>
<td>R. PROFIT MARGIN ON SALES (I/C)</td>
</tr>
<tr>
<td>S. BASIC EARNINGS POWER RATIO (I/F)</td>
</tr>
<tr>
<td>T. RETURN ON TOTAL ASSETS RATIO (I/F)</td>
</tr>
<tr>
<td>U. RETURN ON COMMON EQUITY (I/H)</td>
</tr>
</tbody>
</table>
The chronic financial deficit of EDL is a result of high amounts of losses (commercial and technical) as well as of low tariffs and high levels of external debt.

a. Losses

These losses (figure 13) are divided into two kinds:

- Commercial losses (27.02% of generation & purchases in 2008): Unpaid electricity bills or uncollected bills to customers (estimated 10% of Billing) and Non-Technical Losses or theft (20.57% of generation & purchases in 2008): due to “unauthorized consumers” referring both to illegally connected consumers (i.e. without meters) and to legally connected consumers (i.e. with tampered meters).

- Technical losses: Losses in Power generators, transmission and distribution lines (estimated 15% of power produced and purchased)

Table 15: Evolution of Technical and Non-Technical Losses from 2001 until Sept-08

| Source: Electricite du Liban |

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>6m 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Purchases</td>
<td>1,375</td>
<td>1,155</td>
<td>1,281</td>
<td>1,279</td>
<td>1,637</td>
<td>1,567</td>
<td>1,682</td>
<td>573</td>
</tr>
<tr>
<td>B Generation</td>
<td>7,399</td>
<td>8,728</td>
<td>8,699</td>
<td>8,790</td>
<td>8,801</td>
<td>8,361</td>
<td>9,598</td>
<td>6,285</td>
</tr>
<tr>
<td>C Purchases + generation</td>
<td>9,774</td>
<td>9,983</td>
<td>9,997</td>
<td>10,069</td>
<td>10,238</td>
<td>9,926</td>
<td>10,380</td>
<td>8,458</td>
</tr>
<tr>
<td>D Technical losses *</td>
<td>1,376</td>
<td>1,432</td>
<td>1,477</td>
<td>1,210</td>
<td>1,336</td>
<td>1,487</td>
<td>1,537</td>
<td>774</td>
</tr>
<tr>
<td>E Net distributed power (C - D)</td>
<td>7,598</td>
<td>8,401</td>
<td>8,418</td>
<td>8,559</td>
<td>8,702</td>
<td>8,439</td>
<td>8,623</td>
<td>4,684</td>
</tr>
<tr>
<td>F Thefts or Non-technical losses</td>
<td>2,654</td>
<td>2,924</td>
<td>2,161</td>
<td>1,970</td>
<td>1,825</td>
<td>1,073</td>
<td>2,080</td>
<td>1,061</td>
</tr>
<tr>
<td>G Billing (E - F)</td>
<td>5,344</td>
<td>5,477</td>
<td>6,250</td>
<td>6,589</td>
<td>6,877</td>
<td>6,564</td>
<td>6,643</td>
<td>3,523</td>
</tr>
<tr>
<td>H Unpaid bills **</td>
<td>514</td>
<td>578</td>
<td>632</td>
<td>619</td>
<td>608</td>
<td>616</td>
<td>674</td>
<td>393</td>
</tr>
<tr>
<td>I Cash inflow (G-I)</td>
<td>4,820</td>
<td>5,398</td>
<td>5,618</td>
<td>5,970</td>
<td>6,189</td>
<td>5,948</td>
<td>6,169</td>
<td>2,991</td>
</tr>
<tr>
<td>J Commercial losses (F + H) / C</td>
<td>34.54%</td>
<td>34.21%</td>
<td>27.99%</td>
<td>26.11%</td>
<td>24.65%</td>
<td>25.60%</td>
<td>26.53%</td>
<td>27.02%</td>
</tr>
<tr>
<td>K Total Losses (D + F + H) / C</td>
<td>49.54%</td>
<td>49.21%</td>
<td>42.99%</td>
<td>41.11%</td>
<td>39.55%</td>
<td>40.58%</td>
<td>41.53%</td>
<td>42.02%</td>
</tr>
</tbody>
</table>

* Technical losses are estimated at 15% of Purchases + generation
** Unpaid Bills are estimated at 10% of Billing
b. Tariffs

Too low revenues result also from tariffs that have not been changed since 1994 and that have not been adjusted to take into account the massive increase in the international oil price in recent years. This freeze in tariffs was partly due to the continuous un-reliability of the electricity service in Lebanon. Therefore, any tariff increase is most likely to be met by demonstrations and protests by electricity consumers and by an important decline in the billing and collections (World bank, 2008). In 1994, oil was traded at the price of 25 to 30 US$/Barrel and it increased gradually to reach around 75 US$/Barrel in 2006 and then peaked in July 2007 reaching 150 US$/Barrel, then it slashed back in end of 2008 beginning 2009 to 40 US$/Barrel.

The overall average tariff for 2006, based on billed energy, was 141 LBP/kWh (9.4 US cents/kWh). The average prices by consumer category are provided in table 17. The present structure is not based on economic principles, and as such does not promote efficiency of consumption, and optimal operation of the generating plants.

Lebanon’s electricity tariff level is high by regional standards and in relation to service quality (figure 14), but too low to cover EDL’s costs. Minister Alain Tabourian
in an interview with “le Commerce du Levant” in December 2008 mentioned that in the first semester of 2008, the average cost of production reached 22.5 UScents/KWh, whereas average tariffs was priced at 8.5 UScents/KWh meaning that the government is subsidizing each consumer by more than 10 UScents/KWh. However, in the region, Lebanon presents more similarities with countries dependent on imported fuel for power generation, such as Morocco and Jordan, and the Lebanese tariff level is comparable to these countries. (World Bank, 2008)

Tariff levels are periodically reviewed by EDL and the Ministry of Finances, to verify the widening gap between costs and tariffs.

Table 16: Electricity Tariffs as of 2009 (from 1994)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Tier</th>
<th>Energy charge (LBP / kWh)</th>
<th>Energy charge (cents / kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Low Voltage</td>
<td>1 to 100 kWh/month</td>
<td>35 LBP / kWh</td>
<td>2 cents / kWh</td>
</tr>
<tr>
<td>Household</td>
<td>101 to 300 kWh/month</td>
<td>55 LBP / kWh</td>
<td>4 cents / kWh</td>
</tr>
<tr>
<td></td>
<td>301 to 400 kWh/month</td>
<td>80 LBP / kWh</td>
<td>5 cents / kWh</td>
</tr>
<tr>
<td></td>
<td>401 to 500 kWh/month</td>
<td>120 LBP / kWh</td>
<td>8 cents / kWh</td>
</tr>
<tr>
<td></td>
<td>&gt; 500 kWh/month</td>
<td>200 LBP / kWh</td>
<td>13 cents / kWh</td>
</tr>
<tr>
<td>+ monthly connection charge</td>
<td>&lt;10 KVA</td>
<td>1,200 LBP / KVA</td>
<td>80 cents / KVA</td>
</tr>
<tr>
<td>+ Rehabilitation charge</td>
<td>&gt;10 KVA</td>
<td>5,000 LBP</td>
<td>332 cents</td>
</tr>
<tr>
<td>Public lighting, public administrations, hospitals, schools ...</td>
<td></td>
<td>10,000 LBP</td>
<td>663 cents</td>
</tr>
<tr>
<td>Crafts and agriculture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Medium Voltage</td>
<td>night period</td>
<td>80 LBP / kWh</td>
<td>5 cents / kWh</td>
</tr>
<tr>
<td>Subscription equal to or exceeding 100 kVA</td>
<td>night peak period</td>
<td>320 LBP / kWh</td>
<td>21 cents / kWh</td>
</tr>
<tr>
<td></td>
<td>other periods of the day</td>
<td>112 LBP / kWh</td>
<td>7 cents / kWh</td>
</tr>
<tr>
<td>Subscription below 100 kVA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lighting loads</td>
<td></td>
<td>140 LBP / kWh</td>
<td>9 cents / kWh</td>
</tr>
<tr>
<td>industry and agriculture (active power)</td>
<td></td>
<td>130 LBP / kWh</td>
<td>9 cents / kWh</td>
</tr>
<tr>
<td>+ monthly connection charge</td>
<td></td>
<td>1,200 LBP / KVA</td>
<td>80 cents / KVA</td>
</tr>
<tr>
<td>+ Monthly Rehabilitation charge</td>
<td></td>
<td>200 LBP / KVA</td>
<td>13 cents / KVA</td>
</tr>
</tbody>
</table>

Source: Electricite du Liban
c. Debt burden

Even to cover its limited supply, the industry required increasing external financing. The huge amount of loans extended to EDL reached a crisis point (table 18), constituting a large burden on the Lebanese economy. These loans are divided as follows:

- Internal debt: this is the debt with the Lebanese State and it covers fuel expenses government loans as well as advances to redeem the external loans. It is constituted of Treasury advances from the Government of Lebanon to EDL going from 1996 until 2007 and amounting to USD 4,205 million. Transfers to EDL increased significantly in the past decade, as they represented 1% of GDP in 2001 going up to 4% in 2007 (figure 15). The main reason behind this considerable increase was the important surge in oil prices (figure 16).

- External Debt: this is the financial debt for rehabilitation works that was taken out with international banks (EIB, World bank…) and foreign government organizations under financing agreements signed between the Lebanese and foreign governments. This debt will mature in 2016. However, starting year 1999, EDL stopped repaying its external debt, which is now being refunded by the Lebanese Government.
Therefore, EDL has to reimburse USD 1,615.92 million to the Lebanese Government, representing the annual payments amount of the External debt going from 1999 to 2006. The remaining external debt to be paid by EDL (or by the Government of Lebanon) reached USD 611.11 million.

Moreover, the total level of grants to EDL from 1982 until the present time reached USD 1,334 million. These grants are divided as follows:

- subsidies which were granted to EDL from 1994 to 1996 and which amounted USD 352 million.
- Treasury advances which were cancelled (1982 to 1996) and recorded as part of EDL’s Share Capital; they amounted USD 982 million.

It is worth mentioning that in article 18 of the 2001 National Budget, the Parliament allowed the Government of Lebanon to cancel all the Treasury advances to any National Institution and record it under the Share Capital of this institution (in favor of the State) in the case where it is transformed into a joint stock company as a part of the privatization process.

<table>
<thead>
<tr>
<th>Grants</th>
<th>1984</th>
<th>1995</th>
<th>1996</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stubsides from the Government of Lebanon (National Budget) to EDL (a)</td>
<td>36.43</td>
<td>131.07</td>
<td>134.16</td>
<td>351.66</td>
</tr>
<tr>
<td>Treasury advances cancelled and recorded under the Share Capital of EDL (b)</td>
<td>158.00</td>
<td>1996 to 1995</td>
<td>1994 to 1996</td>
<td></td>
</tr>
<tr>
<td>1. According to the Decision of the Council of Ministers No 3, dated 1/8/1982</td>
<td>564.35</td>
<td>284.33</td>
<td>270.02</td>
<td></td>
</tr>
<tr>
<td>2. According to the law No. 345, dated 24/07/95 (from 8/1995 to 31/12/92)</td>
<td>284.33</td>
<td>270.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which: Advances for projects and expurgations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which: Advances to buy Fuel (only 1995)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. According to the law No. 389, dated 26/03/96 (from 01/01/94 to 26/03/96)</td>
<td>250.49</td>
<td>106.99</td>
<td>152.90</td>
<td></td>
</tr>
<tr>
<td>of which: each contribution to EDL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which: Advances to buy Fuel and for the redemption of External Loans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (1+2+3)(b)</td>
<td>981.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total of Grants from 1982 until present (a+b)</td>
<td>1,334.51</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Internal Loans

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury advances from 26.08.95 until 31.12.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which: Advances to buy Fuel</td>
<td>65.49</td>
<td>-</td>
<td>-</td>
<td>183.00</td>
<td>57.00</td>
<td></td>
</tr>
<tr>
<td>of which: Advances for redemption of External loans</td>
<td>11.30</td>
<td>4.61</td>
<td>95.04</td>
<td>201.00</td>
<td>131.00</td>
<td>262.00</td>
</tr>
<tr>
<td>Total</td>
<td>76.79</td>
<td>4.61</td>
<td>95.04</td>
<td>386.00</td>
<td>188.00</td>
<td>262.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury advances from 31.12.03 until 31.12.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which: Advances to buy Fuel</td>
<td>115.00</td>
<td>121.00</td>
<td>423.00</td>
<td>610.00</td>
<td>784.00</td>
<td>2,390.49</td>
</tr>
<tr>
<td>of which: Advances for redemption of External loans</td>
<td>159.00</td>
<td>262.00</td>
<td>223.00</td>
<td>399.00</td>
<td>197.00</td>
<td>1,851.96</td>
</tr>
<tr>
<td>Total</td>
<td>274.00</td>
<td>383.00</td>
<td>646.00</td>
<td>909.00</td>
<td>981.00</td>
<td>4,242.45</td>
</tr>
</tbody>
</table>

### External Loans

| External debt to be redeemed by EDL from 1999 to 2016 (principal - interest) | 1,927.05 |

**Source:** Ministry of Finance

---

**Fig. 15 Annual Treasury Transfers to EDL as a Percentage of GDP**

**Source:** Ministry of Finance

---

**Fig. 16 Treasury Transfers to EDL and Crude Oil Prices**

**Source:** Ministry of Finance
d. Administrative and Accounting Systems

The administrative and accounting systems at EDL are outdated and partly obsolete. They are largely paper-based. Organizational structures, processes, and work procedures need to be updated and upgraded. (IPP MSC energy, 2005)

The weaknesses of the accounting section consist of the following:

- The accounting code system used is the modified French system of 1957 and it has not yet been adapted to the Lebanese Accounting Code or International Accounting Standards.
- There is no integrated information system
- There is no instruction manual for using the accounting codes
- There is no analytical accounting system
- There are delays in the regular reports and unreliability of the information contained in them

E. Transacting Environment

1. Partners

The Lebanese territories that are not covered by EDL, are handled by a few concessions that are active in generation, transmission and distribution activities. These concessions remain controlled and overviewed by MEW. Subject concessions are herein detailed: (Abi Said, 2008 and MEDA report, 2002)
a. **Private Power stations:**

- **Kadisha (Electricity of North Lebanon) 1924 – 2011 (87 years):** In its first years of operations (between 1924 and 1936), five different concessions in generation, transportation and distribution of electricity in North Lebanon were granted to Kadisha.

  At a later stage, the company extended its activities outside its concessions. Currently, it owns five hydro plants as well as one thermal power plant (Hraychë).

  In 1986, Kadisha Company’s assets were transferred to the state and the management of the company was handed over to EDL. In 1995, EDL purchased approximately 98% of Kadisha Company’s shares. However, the company was not integrated into EDL.

  Now, in 2008, Kadisha is run as a private company by the same board of directors as EDL, and the integration of “newly owned” entity of Kadisha is submitted to the Council of Ministers. The actual tendency is favorable to said integration.

- **Litani River Authority (LRA):** LRA is a public authority. It was created by Law in 1954, to undertake the hydro-generation and irrigation schemes from the Litani River. In 1962, LRA started generating electricity and owns currently the three largest hydro plants in Lebanon (191.5 MW installed capacity):
  
  i) Abdel Aal (Markabé)
  
  ii) Awali
  
  iii) Joun (Charles Helou)

  LRA sells all its produced electrical power to EDL.
Nahr Ibrahim Concession (The Pheonicia Power Company) 1927 – 2026

(99 years): In 1927, a concession was granted to undertake the hydro-generation and irrigation schemes from the “Nahe Ibrahim” river.

The concession is a run of the river plant located in the North between Tripoli and Batroun. It has an average yearly production of about 90 GWh, sold to EDL network.

Nahr Ibrahim is owned by the Hani Family.

Bared Concession 15/1/1936 – 15/1/2021 (85 years): In 1946, a Concession was granted to undertake the hydro-generation from the Bared River.

Bared is a run of the river plant located at around 15 km Northern Tripoli. Its average yearly production is about 45 GWh.

Bared is a private company owned by EDL (45 %) and Cheikh Selim El-Khoury (55%).

b. Distribution Concessions

There are currently four distribution concessions:

• Zahle concession: the concession distributes electric power to about 42,000 customers in March 2007. In 2002, Zahle concession contract reached its term. However the distribution concession was extended for 15 additional years following a decision by the Council of Ministries. The concession purchases power from EDL.

• Jbeil concession: the concession distributes electric power to 19,201 customers in 2002. It is owned and operated by the Bassil family. The concession purchases power from EDL.
• **Bhamdoun concession:** the concession distributes electric power to 2,500 customers in 2002. It is owned by the Khayrallah family. The concession purchases power from EDL.

• **Aley concession:** the concession distributes electric power to 13,150 customers in 2002. The Concession contract has reached its term. However, the contract was not renewed. The company is currently managed by a committee formed of EDL and MEW representatives. It is pending a decision by the Council of Ministries to be merged with EDL. The concession purchases power from EDL.

The tariff to distribution concessions is 5 UScents/kWh, almost half of the average tariff charged to consumers. The concessionaires in turn sell the electricity supplied by EDL at about 10 UScents/kWh earning a margin of 5 UScents/kWh, which is a very significant distribution margin (World Bank, 2008). The loss to EDL is estimated by the World Bank to amount about US $20 million per year based on sales of about 900 to 1000 GWh which will increase to over US$ 40 million per year by 2015.

c. **Future of Concessions**

The Lebanese government’s right for concluding concession contracts was granted by law in 1924. However, the Lebanese Constitution inflicted that these contracts can only be concluded for a given non-renewable duration. Furthermore, as soon as the contracts expire, the concessions’ assets will have to be transferred to EDL. (Baroudi, 1999)
2. Competitors

As a result of electricity rationing and the bad quality of EDL services, Lebanese citizens were obliged to “revert to alternative power supply systems as back up”. These systems included (i) Uninterrupted Power Supply (UPS) or battery back-up for safeguarding computers, telecommunication equipments, data centers and other electronic as well as (ii) private power generators. (Abisaid, 2001 and IPP MSC Energy, 2003)

This bad situation was a drive in the development of a parallel independent network of “autonomous producers” or electricity generators spread all over the country in each city and even in each neighborhood. These producers became in the past decade an important informal back-up each time there is an electric power shortage by EDL. The generators have a capacity that varies from few KW to hundreds of KW and their global capacity is estimated to be around 600 MW. According to the World Bank, they generated nearly 4400 GWh of electricity in 2006. (Abisaid, 2001 and IPP MSC Energy, 2003)

In this context, the autonomous producers can be divided into two different groups: (Abisaid, 2001 and IPP MSC Energy, 2003)

- The self-producers who produce electric power for their own private consumption (factories, commercial centers, residential buildings hotels, hospitals, etc…). Some of the self-producers are completely disconnected from EDL’s distribution grid (mainly in huge industrial factories).

- The “neighborhood generator” producers selling electricity “through an independent micro network to a number of subscribers”. These producers always charge a fixed rate that depends on the subscription capacity without installing any meters to measure the amount of electrical energy supplied. For example, a 5 Amperes capacity subscription costs around 40$ per month whether there is consumption or not. More
than 90% of EDL clients have access to the “neighborhood generators” ensuring their minimal needs whenever there is a shortage of supply from the electric utility.

The juridical status of these informal producers is still not clear, yet the government is “keeping its eyes closed” on the issue since EDL can not fulfill the demands of the consumers.

The World Bank, in its report on EDL established in 2008, estimated that in 2006, 34% of the electricity demand in Lebanon was met through self-generation, 61% was supplied by EDL and the rest or 5% represented suppressed demand (figure 17). This is estimated to cost the consumer on average, an additional 25% on top of what they pay EDL every month; and the electricity sector nearly US$ 360 million in lost sales per year. Moreover, since demand for electricity in Lebanon is likely to reach more than 4,000 MW by 2015 based on World Bank estimations, this will require additional new capacity of 1,500 MW. Therefore, “unless EDL improves its ability to supply electricity and install new capacity and restore consumer confidence, back-up generation will increase its share of electricity supply in Lebanon from 33% at present to close to 60% by 2015”. (World Bank, 2008)

![Fig. 17 Estimated Total Demand of Electricity in 2006 (in GWh)](image)

Source: World Bank
The anarchic development of the private power generators has lead to a series of complicated problems and issues such as (IPP MSC Energy, 2003):

- Judicial problems: Absence of all rules relative to the establishment and the functioning of these power Generators allowing their installation without any prior authorization from any legal institution and preventing control of safety or quality.

- Environmental problems: Atmospheric pollution due to frequently deficient installations and bad combustion and the absence of periodic maintenance; noise pollution due to high noise levels, visual pollution due to inadequate choices of the locations where the generators are installed, and soil pollution due to the spill of oil and fuels.

- Technical problems or bad quality of the supplied electricity: significant fluctuations in frequency and voltage, repeated cut outs of the electric current, overloaded power station and network and frequent block outs.

- Unjustified and excessive fixed rates and abusive billing by the autonomous producers which is resentfully accepted by the users in the absence of all other alternatives.

- The frequent use of EDL network for the distribution of electricity with all incurred risks.
3. Government

Several ministries are overseeing the Electric Power Sector (table 18) (MEDA report, 2002 and Abisaid and Baroudi, 2001):

The Ministry of Energy and Water approves the decisions of the Board concerning EDL’s budget its employees, their work programs, the financial accounts, the loans, the tariff fixing and other financial issues.

The Ministry of Finance has a financial supervision role. It is in charge of auditing the budget, the balance sheet, the profit & loss accounts, the loans and the tariffs fixing in conjunction with The Ministry of Energy and Water.

The Council of Ministers appoints, and holds the power to revoke EDL’s Board members and its General Manager. The Ministry of Energy and Water exercises a control of an administrative nature over the entire functions of EDL, participating in the daily management of the institution.

Table 18: Authorities Overseeing EDL

<table>
<thead>
<tr>
<th>Powers</th>
<th>Authorities</th>
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<tbody>
<tr>
<td>Energy &amp; electricity policies</td>
<td>Ministry of Energy &amp; Water (MEW)</td>
</tr>
<tr>
<td>Sector planning</td>
<td>Ministry of Energy &amp; Water (MEW)</td>
</tr>
<tr>
<td>Financial Supervision</td>
<td>Ministry of Finance (MOF)</td>
</tr>
<tr>
<td>Government ownership</td>
<td>Ministry of Energy &amp; Water (MEW)</td>
</tr>
<tr>
<td></td>
<td>Council of Ministers</td>
</tr>
<tr>
<td>Licensing &amp; authorizations</td>
<td>Ministry of Energy &amp; Water (MEW)</td>
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<td></td>
<td>Council of Ministers</td>
</tr>
<tr>
<td>Investment financing &amp; tendering procedures</td>
<td>Ministry of Energy &amp; Water (MEW)</td>
</tr>
<tr>
<td></td>
<td>Council for Development and Reconstruction</td>
</tr>
</tbody>
</table>

Source: MEDA report
F. Macro-Environment

1. Political Situation of the Country

Lebanon was devastated by the civil war which lasted from 1975 to 1990. This conflict resulted in significant infrastructure damage, substantial human losses, considerable reduction in economic activity and in GDP, significant public sector deficit and large capital outflows.

The post-conflict era was characterized by large physical and financial reconstruction efforts financed by extensive borrowings. This resulted in large public sector deficits.

During the past four years, Lebanon witnessed a series of significant events including (Byblos Bank, 2009):

- the assassination of Mr. Rafic Hariri, former Prime Minister along with 21 others in February 2005,
- the cedar revolution on 14 March 2005 followed by the withdrawal in April of Syrian army troops from Lebanon,
- the adoption of a U.N. Security Council resolution establishing an international tribunal in order to try suspects in the murder of Mr. Hariri,
- a continuous assassination campaign of Lebanese political leaders as well as public figures,
- Israeli airstrikes and artillery fire and air and naval blockades during the 33 days military conflict in July and August 2006
- clashes and confrontations between members of “Fateh al Islam” a fundamentalist and terrorist militia and the Lebanese Army forces around the “Nahr-El
Bared” Palestinian refugee camp located in Northern Lebanon during May and September 2007

• Following the Council of Ministers meeting in May 2008, that adopted many resolutions including: increase in the minimum wage, reassigning the Chief of Security of the airport to another position and declaring the telecommunication network operated by Hizbollah as illegal. A couple of days later, a national strike occurred to ask for further increases in the minimum wage. The strike turned into protests against the resolutions of the Council of ministers by opposition supporters, blocking a number of roads and resulting in heavy armed clashes between supporters of the March 14 alliance and opposition supporters.

• Based on the Arabs’ initiative to contain the crisis in Lebanon, a dialogue conference was held between the different Lebanese political parties in Doha (Qatar) between May 16 and May 21, 2008. The different parties reached an agreement which ended the “long-standing political stalemate” and lead to the election of Army Commander General Michel Suleiman as President of the Lebanese Republic on May 25, 2008.


• Government decision to hold a national general parliamentary election on June 7, 2009.

2. Economic Situation of the Country

Before the civil war of 1975, Lebanon was a prosperous country characterized by high economic growth, low inflation, large influx of foreign capital, stable domestic currency and large balance of payments surplus. Moreover, Lebanon transformed itself
into “a major banking center” within the neighboring countries through “avoiding restrictions on foreign exchange or capital movement and enforcing strict bank secrecy regulations”. (www.nationsencyclopedia.com)

However as mentioned before, after the Civil war, Lebanon’s infrastructure was severely damaged and the physical destruction was estimated by the United Nations to have cost around US$ 25 billion. As a result, Lebanon had to focus on physical reconstruction and rehabilitation by borrowing heavily contributing to a large budget deficit.

In 2002, in an attempt to reduce the ballooning budget deficit, the Rafic Hariri government pulled together the Paris II Donors Conference raising US$ 4.4 billion in pledges for the Lebanese Government. However, initiatives for financial reforms were delayed and the public debt continued to grow heavily. (CIA World factbook)

The Israel vs. Hizbollah military conflict in July and August 2006 caused major infrastructure damage, estimated for US$ 3.6 billion. These damages prompted Arab countries to pledge more than US$ 1 billion to assist the Lebanese State in the reconstruction and recovery program. (CIA World factbook)

In January 2007, the “International Conference for Support to Lebanon” or Paris III Donor Conference was held and it pledged to Lebanon nearly $7.5 billion for budget support and development projects. The loans were conditioned on the progress of the Lebanese fiscal reform as well as the privatization program. In fact the government privatization program that was launched since 2000 when it voted for the privatization law n° 228 setting the general framework for SOE privatization. However, the privatizing program has not started so far.
Later, the confrontations between the Lebanese Army and members of “Fateh al Islam”, the long standing political stalemate and the armed clashes between supporters of the March 14 alliance and opposition supporters, hampered Lebanon’s economic activity especially in tourism and investment.

Since the Doha Accord on 21 May 2008, political stability increased and has helped boosting tourism and investments in the Lebanese market.

Moreover, despite the global financial crisis, Lebanon succeeded to remain immune thanks to the conservative regulations of the Central Bank of Lebanon. In fact, Riad Salameh, governor of the Central Bank of Lebanon said in an interview with BBC News on December 5, 2008 “I saw the crisis coming and I told the commercial banks in 2007 to get out of all international investments related to the international markets”.
CHAPTER IV
WHAT HAS BEEN DONE

A. Main Electricity Sector Laws

The Lebanese government tried numerous times to launch much needed administrative reforms before deciding the privatization implementation. Nevertheless, all efforts remained in vain and no improvement of the EDL performance was registered.

This situation pushed the parliament to vote for two new laws, the Privatization law n° 228 dated May 31, 2000, and the Electricity law or the Law of Electricity sector Organization n° 462 dated September 5, 2002, in order to induce the reform of the electricity market, from a regulated national monopoly into a competitive market.

However, these two laws have many shortcomings and lacked many aspects that would hamper the future benefits expected from a privatization program.

1. Privatization Law (n° 228)

a. Main Provisions of Law n° 228

In May 31, 2000, the Lebanese parliament adopted a Privatization Law (n° 228), which sets the framework for the privatization of state-owned enterprises (SOEs).

Privatization, as the Privatization Law dictates, aims to realize the three following goals:

- improve the effectiveness of the Lebanese economy and in particular the effectiveness of the public sector. Improve the services provided to the public and
secure major improvements in the competitiveness of production, increasing growth rates and raising living standards;

- increase investments in Lebanon, and as a result introduce new technologies and administrative experience to support the competitive power of these sectors
- lower the rate of public debt as compared to the GNP

The privatization law established a Higher Council for Privatization (HCP) which consists of: (Privatization law, 2000)

The President of the Council of Ministers President
The Minister of Justice
The Minister of Finance
The Minister of Economy and Trade Members
The Minister of Labor
The Minister concerned

The HCP represents the organizational and monitoring frame of the privatization act. It deals with all privatization plans and their implementation; it takes decisions and presents them to the Government of Lebanon (GOL) for approval.

GOL through the HCP should follow the convenient implementation of the program. Also, GOL is allowed to conserve a “Golden Share” in companies of strategic and monopolistic nature to protect national interest. It also introduced the possibility to appeal against government dealings at the special courts. (Rabbath, 2001)

b. Main Gaps and Inconsistencies of Law n° 228

The major shortcomings of the privatization law can be summarized as follows: (Shehadi, 2006)
• There is no “clear champion of privatization”

• The decisions and deliberations of the HCP are confidential

• The key decisions of this law are not consistent

• The responsibilities of the HCP Secretariat versus ministries are not clearly defined. For example, in June 2001, the Council of Ministers instructed Ministry of Transport rather than HCP, to select advisors for privatization

• The Higher Council for Privatization (HCP) does not have any control on the entities that are in the process of being privatized

• There is no independent mechanism to enforce conflict of interest rules

• HCP has no direct control over entities that are candidates for privatization

• HCP Secretariat’s resources for public communication is limited

• There is no formal consultation process with experts hired by HCP, and no mechanism for daily supervision of experts

• There is no consultation with the public

2. Law of Electricity Sector Organization n° 462

a. Main Provisions of Law n° 462

In fact, a new Electricity law: the Law of Electricity sector Organization n° 462 (Electricity Law), was enacted in September 5th 2002. This law sets forth the rules, principles and framework governing the electricity sector, including the Government role in this sector, the principles and bases regulating it, as well as the rules governing the total or partial transfer of this sector or of its management to the private sector.

The main provisions of this law are as follows:
• Vertical separation (functional unbundling) of electricity generation, transmission and distribution activities;
  • Incorporation of the new companies resulting from the restructuring of the electricity sector;
  • Provision for the privatization of the generation and distribution activities;
  • Creation of the Electricity Regulatory Authority (ERA), a regulator with regulatory, advisory and supervisory functions;
  • Provision on the duties and powers of the Ministry of Energy and Water (MEW);
  • Provision on regulation of tariffs for transmission and distribution of electricity and on determining the ceiling of the prices of production services;
  • Provision on License and authorization procedures;
  • Provision on concessions granted before the issuance of this law;
  • Provision (definition and activities performed) on the participants of the electricity market: Production, Transmission, and Distribution;
  • Provision on Inquiry and investigation procedures by inspectors and the imposition of sanctions in the case of violations;
  • Provision on legal proceedings in the case of violations;
  • Provision on the settlement of disputes arising between the providers of electricity services or between, providers of electricity services and their subscribers or the beneficiaries of their services.

The Law provides that by virtue of a decree issued by the Council of Ministers, upon the proposal of the Higher Council for Privatization, one or more joint-stock companies, known as “Privatized companies”, may be incorporated, whose object will
be to carry out “all or part of the Generation and Distribution activities”, pursuant to a license issued by the Electricity Regulatory Authority for a maximum period of 50 years.

The government may within a maximum period of two years as the incorporation date of any “Privatized Company”, sell a percentage that does not exceed 40% of the shares of this company to an investor (which submits the winning bid at the auction) from the private sector.

The Law also provides that the transmission of electric power shall remain owned by the State. Agreements may be signed for the management, operation, development, or equipment of the Transmission activities with the private sector. An Electricity Regulatory Authority (ERA) in charge of regulating and controlling the electricity sector will be created, and will enjoy legal personality and technical, administrative and financial autonomy. The authority will have various duties and powers including, inter alia:

- Preparing studies, decrees and draft regulations related to the implementation of the provision of this law;
- determining ceilings on the prices for Generation services, tariffs applied on various services of electricity, Transmission and Distribution, subscription fees, fines and other fees, and their method of collection;
- ensuring that all holders of Licenses benefit equally from the Transmission equipment, according to tariffs set;
- promoting the investment in the electricity sector, working on improving the operational efficiency and guaranteeing the quality of the services and its good performance;
• ensuring and encouraging competition in the electricity sub-sector, supervising and controlling non-competitive tariffs and ensuring the transparency of the market etc...;

• Regulating the quality of service;

• Determining and enforcing technical and environmental standards;

• Issuing, renewing, suspending, amending and canceling licenses and Authorizations and ensuring compliance with their conditions;

• Controlling the compliance of the holders of generation and distribution licenses and Authorizations as well as the transmission sector, with the laws, regulations, agreements, conditions of the licenses and authorizations, and the terms of reference for purposes of providing to the consumers better services, in particular with respect to tariff regulations and subscription contract;

• Ensuring that all holders of licenses and authorizations equally benefit from the Transmission equipment, according to the tariffs set;

• preparing an annual report and submitting it to the Council of Ministers;

• Arbitrating to resolve disputes between Licensees and between Licensees and consumers;

• Taking any decision, measures, or any duties or actions specified in the present law.

In Lebanon, some amendments to the legal framework and the enactment of secondary legislation will be necessary in order to promote competition in competitive activities and to regulate natural monopolies.
The Lebanese Electricity Law establishes rules regarding some of these key areas, particularly concerning vertical unbundling and the institutional framework, but it also has important gaps. There are key issues that are not included in its provisions and it has many inconsistencies.

If the gaps and inconsistencies of the Electricity Law are not covered by the regulation or even better, by an amendment to the Electricity Law, then there will not be a proper open market, and thus, the goals expected from it will not be achieved. There will be probably a vertically unbundled electricity sector, but competition will hardly develop, control of monopoly activities will be difficult and abuses of dominant positions can be expected. This will have a negative impact in investments, in protection of consumers and users of networks, and in the overall development of the energy sector.

In this regard, there are key issues that should have been included in the Electricity Law but they were not, in particular: the establishment of a system of access to the networks (third-party access), the opening of the market (even if limited), and the establishment of a wholesale electricity market.


i. No Mention of Supply Activity

The Lebanese Electricity Law only distinguishes the activities of generation, transmission and distribution, but it does not identify the activity of supply. Even if supply is an activity usually provided by the distribution company, it is conceptually different from the activity of distribution.
Supply is the contracting for, and selling of, electricity to end-users. Distribution is the transport of electricity through distribution networks, which are defined by the law as those lines operating at 24 kV or at lower voltage. Supply is a potentially competitive activity whereas distribution is a natural monopoly activity.

As mentioned before, Supply includes wholesale and retail as well as metering and billing, and it can comprise other activities such as customer information, advice and financing. Traditionally, in non-deregulated markets, end-user supply has been bundled with distribution in markets with monopoly structure, but it can be performed separately. However, the deregulation of a power market and the development of competition require some form of vertical separation between both distribution and supply.

ii. No Mention of System Operation

Law n° 462 does not identify the activity of system operation. System operation is a different activity from network activities of transmission and distribution.

iii. No Opening of the Market

Consumers and types of consumers (eligible and non-eligible) are neither defined nor mentioned in the Electricity Law.

As we considered before, development of competition needs not only to be established on the offer side but also on the demand side. Therefore, it is necessary to allow consumers, at least some of them, to freely choose their energy supplier, which is called the “opening of the market”. The percentage of consumers allowed to choose their supplier determines the degree of opening of that national energy market.
The opening of the market must be adapted to the local circumstances of each country. In Lebanon, it is advisable to conduct a progressive opening of the market, step by step, assessing which is the appropriate degree of the market to be opened at each stage. It should start allowing to very big consumers of electricity to freely choose their supply.

Competition is not possible in the energy market without introducing some consumers’ choice of supply. Therefore, appropriate rules should be included in a possible amendment to the Electricity Law.

The right of end users to choose a supplier creates a major pressure on all the players along the supply chain which is almost impossible to replicate by regulation. And even if consumers do not use the options offered, for instance remaining with the same supplier, it has important indirect effect on prices levels, price structures, product diversity and service conditions.

In this regard, the Lebanese Electricity Law has neither provisions regarding the opening of the market nor provisions granting authorities the power to open the market in the future. Eligible consumers are not mentioned in this law and they seem not to be envisaged.

Therefore, some provisions should be included in the possible amendment to the Electricity Law regarding the opening of the market. It should include, at least, a definition of the different categories of consumers, particularly eligible and non-eligible consumers. It will also grant powers to the national authorities to take decisions about the progressive opening of the market.
iv. No Separation between Generation and Distribution

This law combines generation “and” distribution. According to Privatization Law, the sectors of production, transmission and distribution “shall be functionally, administratively and financially independent from one another”.

However, a legal unbundling is not provided by the Electricity law. Moreover, the vertical unbundling of generation and distribution is necessary to promote transparency and competition. These are different activities and they must be separated. Generation is a potentially competitive activity and distribution is a natural monopoly. Distribution is a network activity related to a specific area whereas generation is not. In competitive markets, generation companies are allowed to sell electricity to any supplier, eligible consumer or centralized market located in any place of the country, and even to export to other countries. Moreover, vertical integration of distribution and generation activities creates many obstacles to competition, such as ability to discriminate, cross-subsidies between activities, difficulties for monitoring, etc...
(Bergman et al, 1999)

v. Transmission Activities

The article 5C of Law N° 462 permits that an operator, different from the owner of the assets, develops the transmission networks and maintains and operates it. In that case, the ownership of the assets by the State or a state company is not significant, it is merely formal.

The capacity of deciding on the development of the network is strategic because in a deregulated market the transport operator could have conflicts of interest if it also owns or controls other activities of the market, such as generation or supply. And
this is allowed in the Law N° 462. In that case, the transmission operator would have
the possibility to discriminate against competitors when deciding on investments for
developing the network, no matter whether or not it owns the assets or not.

Therefore, a possible amendment to the Law N° 462 should not allow
companies carrying out generation or supply (nor the companies that control them), to
perform transmission activities as well. In this way, conflicts of interest are eliminated
as well as the incentives of the transmission company to discriminate, distort
competition or abuse of its monopoly position.

In addition, the government must establish in the secondary legislation all the
requirements under which the transmission operator may propose or decide on
investments for developing the transmission network. In this way, even when a private
operator carries out transmission activity, the Ministry or the Electricity Regulatory
Authority may in any case keep a role in monitoring development of the network. It
might be also possible to require an authorization for certain investments in network
development. And all this may be required even when the owner of the assets is a
private operator.

Moreover, the Electricity Regulatory Authority must also monitor quality of
service as well as security and safety performance, which is linked to the correct
operation and maintenance of the assets.

vi. No Third Party Access

As the electricity flows through networks, its trade necessarily requires having
access to the transmission and distribution networks. As electricity transport (through
transmission and distribution grids) is usually considered natural monopoly, it must be
properly regulated, particularly with regard to the technical and economic conditions of access to transmission and distribution networks.

The establishment of a non-discriminatory system of access to the transmission and distribution networks, so-called third party access system, is one of the main tools and a sine qua non condition for deregulating a power market and developing competition, and also for avoiding abuses from the transmission and distribution operators who perform activities under monopoly conditions. (Palasthy, 2001)

vii. Amicable Settlement

The Electricity Law contains a provision in Article 37 allowing amicable settlement of violations of the licensees.

It establishes that “after confirming the occurrence of a violation and pursuant to the regulations set forth by the Electricity Regulatory Authority and the conditions of the License, the Electricity Regulatory Authority may forward, prior to resolving the appropriate sanction, a notice to the contravener(s) requesting him to remove the cause of the violation within a maximum period of 30 days.

The Electricity Regulatory Authority “may” convene the contravener(s), the prejudiced or any person involved in the violation, to a special meeting, in view of (i) reaching an amicable settlement, (ii) removing the cause of violation, (iii) complying with the provisions of the law and the conditions of the License and (iv) granting indemnities for any damage incurred by the Electricity Regulatory Authority or third parties”. (Electricity law, 2002)

The first paragraph of Article 38 establishes that the Electricity Regulatory Authority “may” decide, after “confirming the violation of the provisions of this law, of
its implementation by-laws or of the conditions of the License and after forwarding a notice and convening a meeting in order to reach an amicable settlement, or without resorting to these two means, to impose sanctions as provided for in Article 39”.

(Electricity law, 2002)

The establishment of this amicable settlement does not have clear advantages, but it does have various clear disadvantages, particularly taking into account that privatization is envisaged.

The drawbacks of this provision are the following:

• It diminishes transparency and predictability of the whole system of rights and obligations;

• It constitutes an obstacle to the proper functioning of incentives (rewards/penalties), which is an important tool of regulation, particularly of monopoly activities;

• It grants the Electricity Regulatory Authority a wide and non-controlled discretionary power, enhancing the possibilities of “capture of the regulator” and even of illegal practices;

• It may create obstacles to the practical imposition of sanctions.

• It may create longer and even more bureaucratic procedures for the establishment of sanctions since it establishes an additional instance. By contrast, the proper functioning of incentives requires the establishment of clear, predictable and efficient procedures for the application of sanctions.

The proper and strict application of sanctions is not only necessary for protecting the interests of consumers, but also for ensuring the appropriate functioning of the whole market and also the sustainability of the system in the long-term.
viii. No “Corporatization”

The Electricity Law does not allow for “corporatization” of EDL as a whole entity but only for the generation and distribution activities. The term “corporatization” is used to describe a process of transforming utility activities from an arm of Government to a corporate structure. In other terms, the utility will be “changed from a part of the civil service into something that is recognizably constituted and run as a business, using the managerial structure and accounting methods of the private corporation”. (MacKerron, 1999). As we will see later, “corporatization” of EDL as a whole entity is a necessary first step to the restructuring and privatization of the electric power sector.

c. Application of Article 4 of Law n° 462 by the Council of Ministers

On 19 September 2003, following the proposal of the HCP based on a study by BNP Paribas the Council of Ministers applied the Article 4 of Law n° 462 and decided the creation of “two privatized” companies from the unbundling of Electricité du Liban (EDL):

(a) the creation of one “privatized” electricity transmission company that shall remain “at the start” owned by the State and could be by virtue of a decree passed by the council of Ministers, upon the proposal of the Minister, to the private sector for management or operation or development or equipping of the related transmission activities

(b) the creation of one “privatized” electricity generation and distribution company which will be transformed into a joint stock company and within 2 years of its
establishment a percentage not exceeding 40% of the shares will be sold to qualified private investor, through an international bid.

However, this decision contradicts Article 4 of Law n° 462 which did not state that the transmission company shall be called “privatized company” (“privatized company” is only for generation and distribution). If such an agreement were got and thus a market player, distribution or generation company, could operate, manage and decide the expansion of the transmission system, then there would be high risks of discriminations against competitors of that market player who manages the transmission system. The situation would be even worse if there was not proper horizontal and vertical unbundling, and if companies with high market share in generation and/or distribution could also control the transmission business.

Moreover, concerning the creation of one single generation and distribution company foreseen by the Decision of the Council of Ministers, it is necessary to point out that this will prevent competition from being carried out and will only transform a state owned monopoly into a privately owned monopoly. This will have negative consequences not only in the development of competition, but also in the protection of consumers and users of networks. There would be real risks of predatory behavior, abuses of dominant position and cross subsidies, particularly when the privatization of distribution and generation is envisaged.

In the absence of competition, the incentives to improve efficiencies will be minimal. Furthermore, the leverage of the regulator on pricing and tariffs will be more limited, due to the absence of a second set of price and cost points.
Foreign experience shows that even in countries where Competition Law prohibits practices such as abuses of dominant positions or predatory behavior, this is not enough to avoid them.

In addition, the ability and the incentives of cross subsidies remain, particularly between regulated and competitive activities. Regulators have less information than regulated companies and, thus, they always lack the necessary information to judge the situation. This asymmetry of information between the regulator and the regulated companies is worse when there are companies vertically integrated.

In fact, an advertisement in the media by the Higher Council for Privatization, in which the Government of Lebanon expressed its interest in receiving "applications of interest" from qualified and experienced companies and capable investors in line with the approved proposals. The Government of Lebanon received seventeen (17) proposals; however no follow-up to the advertisement was registered. The main reason why this decision was not implemented is that, as mentioned before, it was transforming EDL into a privately owned monopoly benefiting one political party in the country and was consequently rejected from other political parties.

One of the main arguments for the creation of one single distribution and generation company from the unbundling of EDL is that this structure will allow to compensate the losses of distribution (technical and commercial losses). This means, implicitly, that cross-subsidies will be allowed between the competitive activity of generation and the regulated distribution activity. But this is not the appropriate solution for tackling the problem of EDL distribution losses.

The result will be a situation which is not compatible with the requirements of a competitive and deregulated market because there will be:
• lack of incentives for efficiency and cost reductions,

• no competition in generation,

• cross-subsidies between activities,

• incentives and ability of the integrated company to discriminate against competitors,

• high difficulties for the regulator to establish adequate tariffs and to control the allocation of costs.
CHAPTER V

EMPIRICAL

A. Purpose of the Study

As we can conclude from the literature review elaborated within the previous chapters, Electricite du Liban is in an abysmal condition. Therefore the utility cannot be privatized with its current state. It should be restructured in order to become more attractive to foreign investors and to raise higher revenues for the government. In the literature review, there is a general consensus that privatization is the best solution. However, issues concerning the restructuring process in the pre-privatization period or the road map that should be followed before privatization as well as the “best” privatization model are debatable.

The primary objective of the study is to figure out in details the steps necessary for the restructuring of Electricite du Liban prior to privatization, and to determine the privatization structure or model that suits best the Lebanese market and most importantly the Lebanese culture.

B. Research Methodology

1. Interviews Design

This report is of an exploratory nature. The questionnaire (Appendix 1) was designed based on the literature review that describes in details the situation of Electricite du Liban as well as the different privatization types and techniques and the lessons learned from previous experiences in other countries. The questionnaire was comprised of two sections: the pre-privatization period and the privatization period.
Section 1 is divided into six parts: Financial restructuring, Human Resources restructuring, Technical restructuring, Legal issues, Investment Climate and Regulatory authority.

The first part focuses on the financial issues that should be tackled before privatizing EDL in order to make it a financially viable institution. The questions included subjects related to the financial deficit (technical and commercial losses), the tariffs charged, the large debts with the Lebanese state and finally the financial evaluation of EDL assets.

The second part is dedicated to Human resources. It addresses the issues concerning EDL staff, their current status and future condition during the restructuring period.

The third part relates to the technical problems facing EDL. It includes questions about electricity supply shortage, the transmission network, the national Control center and the informal autonomous suppliers.

The fourth part focuses on the creation of and the preparation for an enabling investment climate in Lebanon ahead of privatization.

The fifth part relates to the legal issues and mainly on the issues related to the electricity law no. 462 and its possible amendments.

And finally the last part addresses issues related to the regulator, his responsibilities, the timing of his appointment, his role in minimizing political interference and in increasing transparency in the process.

Section 2 focuses on the privatization period. It contains questions on the unbundling of the electricity sector, on the structure of the electricity market that should
be adopted (single buyer, retail competition...), and on the privatization method that should be used (management contract, leasing, concession, divestiture...).

2. Interviews Sample

The questionnaire takes in the view of three managers within Electricite du Liban as well as four prominent figures in Lebanon with a high understanding, experience and exposure to the EDL problems.

The list of interviewees with their respective position is detailed in table 19.

Table 19 List of Interviewees

<table>
<thead>
<tr>
<th>Interviwee</th>
<th>Title</th>
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<tbody>
<tr>
<td>Dr. Kamal Hayeck</td>
<td>Chairman - General Manager of EDL</td>
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<tr>
<td>Mr. Mahmood Baroud</td>
<td>General Manager of exploitation at the MEW</td>
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<td></td>
<td>Government representative at EDL</td>
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<tr>
<td>Dr. Mohammad Alaya</td>
<td>Director of Studies at EDL</td>
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<tr>
<td>Dr. Kamel Shehadi</td>
<td>Chairman and CEO of the Telecommunications Regulatory Authority</td>
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<td>Former advisor to the ex-minister of MEW; HE Mr. Abdo Yammine</td>
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<tr>
<td>Mr. Ziad Hayeck</td>
<td>Secretary-General of the High Council for Privatization</td>
</tr>
<tr>
<td>HE Dr. Sami Haddad</td>
<td>Former Minister of Economy and Trade</td>
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<td></td>
<td>Chairman - General Manager of Byblos Invest Bank</td>
</tr>
<tr>
<td>Mr. Wissam Zahabi</td>
<td>Lead Infrastructure Policy Specialist - UNDP</td>
</tr>
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<td></td>
<td>Government Presidency Advisor</td>
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CHAPTER VI
RESULTS, DISCUSSION AND RECOMMENDATIONS

A. Overall Results and Overview

1. Pre-Privatization Period

a. Financial Restructuring

In this section, interviewees were asked to identify possible solutions to reduce the public expenditures of the Electricity sector in Lebanon which considerably increased over the years as a result of the substantial growth in the cost of operating the sector fueled by the increase in oil prices, in relation to revenue generation under the current tariff and the billing & collection performance. They were also asked about the steps that should be followed to make EDL a financially viable institution able to attract investors.

Various observations were made with respect to the first step of the financial restructuring and which was according to the interviewees “increasing the financial transparency in EDL accounts”. In this respect, an important observation has been made by HE Dr. Sami Haddad “Electricite du Liban does not have a Chief Financial Officer… this is shocking… the minimum is to know the financial facts in order to make the proper diagnosis… so the first step of the financial restructuring process should be to recruit a competent CFO”. Whereas, Mr. Mahmoud Baroud mentioned that currently “EDL accounts are maintained in accordance with the French Accounting Code of 1957 and have not yet been adapted neither to the Lebanese Accounting Code nor to the International Accounting Standards… all the EDL accounting activities are based on manual systems… and very little useful management and cost information can
be extracted from the existing system… so the first step should be to improve the
accounting system”. Kamal Hayek explained that “the finance department currently
employs 97 people out of the 256 people that are supposed to be employed according to
EDL organization chart…and only ten staff out of the 97 have an experience in
finance…. therefore EDL cannot issue reliable financial figures unless qualified people
were employed to do the job.” Dr. Mohammad Alaya said that “The Paris III Reform
Program commits the Government to complete the auditing of EDL’s financial
statements for the years 2002 to 2006…increasing by that the transparency of EDL
financial situation”.

When asked about EDL low tariffs and the necessity to increase it in order to
cover the costs, Mr. Ziad Hayek commented that “it is commonly said EDL is losing
money and it needs to be bailed out… however this is a misconception…EDL is not
losing money… it loses money on its books because this is how it is reflected…but the
reality is that the loss is the cost of the subsidy absorbed by the government in order to
sell electric power to the consumers at this low tariff... EDL’s tariff is arbitrarily set… It
has no connection with reality and for political reasons the government has not
considered increasing it… EDL can not do anything about that, so nobody is blaming
EDL for the major losses that are really related to the difference between the cost of fuel
and tariffs.”

Moreover, the interviewees’ different opinions converged into an interesting
proposition on the approach to carry out a tariff reform. Tariff reforms need to take into
consideration two main elements: the mitigation of the adverse impact of changing cost
of fuel and the development of adequate social protection measures, to alleviate the
detrimental impact on vulnerable consumers.
Concerning the first element, Dr. Kamal Shehadi said “we should diversify our sources of energy… It is not enough to tie tariff prices to the price of oil… There should be more stability… and this can only be achieved through a greater dependence on Long term supply contracts”. Dr. Kamal Hayek commented that “we need to come up with an Energy Plan and to decide on the fuel combination we are going to have: diesel, fuel oil, coal, wind energy, solar energy, hydro energy…” Mr. Wissam Zahabi pointed out that “They should also be diversification of energy sources… Natural gas is cheap, clean, better for the environment, better for the operation and maintenance. However, now the only source of natural gas is from Egypt, through Syria… Negotiations are still taking place, but we don’t have yet a fixed date to when we will get the gas.” Dr. Kamal Shehadi had also an interesting suggestion on minimizing the risk of increasing oil price “We should do some financial planning and some financial projections… for example the price of oil today is at US$ 40 per barrel… we can buy future contracts to hedge against the possible increase in the prices”.

Regarding the second element, HE Dr. Sami Haddad stated that “tariffs should reflect economic and social fairness and equity”. Mr. Wissam Zahabi said that “Tariffs should be adjusted based on the consumption… the adjustments should not affect low income households… those who consume little should pays less”. Dr. Mohammad Alaya commented that “everyone in Lebanon including the rich is being subsidized”. Dr. Kamal Shehadi proposed that “Any increase can be implemented gradually but simultaneously with a diversification strategy but also with an explicit policy to protect those who do not consume energy above a certain threshold… We should take the average consumption of energy a lower middle income family household assuming 24/7 supply of electricity to make up a threshold… Then everyone who consumes less than
the threshold will not have increase in the tariffs paid. However, everyone who consumes more than the threshold will pay higher prices that will increase gradually over the two to three years so that in year three they are tied to an index of the price of oil and gas. The index will be calculated based on a weighting of how much of the generation is from oil and how much is from gas etc…”

When asked about the billing and collection, all the respondents had unanimous views on the actions that should be followed to reduce non-technical losses. They included:

- a revision of the client registry and the billing system;
- the internal reorganization and restructuring of the billing functions within Electricite du Liban with suitable financial and moral incentives to employees;
- the potential outsourcing of the metering, billing and collection to private operators;
- the technological modernization of the billing and metering (this will be discussed in more details in the technical restructuring section).

b. Human Resource Restructuring

The severe administrative problems of EDL are recognized unanimously by all the interviewees. According to Dr. Kamal Hayek “Electricite du Liban is similar to a paralyzed mammoth… it is under-staffed counting only 2,000 employees out of the 5,000 positions in the organization chart… with an average age of 58 years…and most of them lack the required skills”. Mr. Mahmoud Baroud added an important point that “one of the important problems of the Human Resources in EDL and which is not commonly mentioned is the judicial structure that is not adapted to the functioning of
this particular institution…90% of the executive decisions must be endorsed by the minister, reducing all managerial flexibility.”

A common solution to the administrative problems of EDL is its “corporatization” explained by Mr. Wissam Zahabi as “turning EDL into a commercial company (publicly owned) that will not be governed by the provisions of law No. 4517 (The general regulations for “Public Establishments”)].” Mr. Ziad Hayek stated that “EDL should be given its independence, a new independent Board of Directors and it should be allowed to run like a corporation…it would still be owned by the government in the foreseeable future… and management should be rewarded or reprehended (fired) based on its performance…Currently you can not fire employees if they perform poorly, and you can not compensate them if they performed well. There is not any carrot-and-stick approach in a governmental organization”.

When asked about the future status of the employees currently working in EDL during the restructuring period, interviewees mentioned that Electricity Law (law no. 462) tackles this issue. In fact, Dr. Mohammad Alaya mentioned that there will be no lay-offs during the restructuring and privatization periods and enumerated possible scenarios for the outcomes of EDL employees:

- “employees who choose to resign will be granted indemnities;
- some employees remain in the Ministry of Energy and Water;
- some employees are selected to work with the Regulatory authority;
- some employees choose to work in the privatized companies in case privatized companies accept to employ him;
- in the other cases employees will be transferred to other public establishments”.

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c. Technical Restructuring

i. Generation Reform

When asked about the solution to the widening gap between power supply and demand, respondents divided the generation reform program into three time frames: the short run, the medium run and the long run. The medium and long run involve private sector participation and will be discussed in details in the “privatization period” section.

Whereas, regarding the short run, all the interviewees had a unanimous view on the restructuring step that should take place and which is the rehabilitation of Zouk and Jieh, Lebanon’s oldest power plants. Mr. Ziad Hayek said “Zouk and Jieh plants which make up about 40% of Lebanon’s generation capacity are very old and exceeded their expected life span… we can not afford to lose them, if there is any problem, there will be a major blackout… an we do not know when new generation capability is going to come online…therefore there is an urgent need for their rehabilitation… as an insurance for the Lebanese Electric Power Sector.”

ii. Transmission Reform

According to the respondents, the main components of the transmission reform included:

- establishing the National Control Center;
- completing the transmission network and connecting it to the Arab network to import electricity.

Mr. Wissam Zahabi stated that “The National Control Center should be functional…The NCC is the physical management of the network. It is mostly made of computers connected to the grid. They calculate the demand, the level of frequency on
the cables of the grid and they decide when to shut off each plant etc… It is the brain of the grid…Today the grid is still operated like it was in the 1920s. EDL has a single frequency counter and only four people at EDL know how to operate it and they are retiring soon.”

Dr. Kamal Hayek mentioned that “part of the transmission network connected to the Dimas substation in Syria through Ksara substation is not completed due to problems in the Mansourieh area where people are objecting to have power lines near their homes … However, we have isolated this area and found a way to bypass it…so now we can operate the high tension grid.”

iii. Distribution and Supply Reform

Mr. Ziad Hayek proposed the installation of digital metering “costing between US$ 200 and US$ 300 million which is nothing compared to what we lose”. The project was baptized “Collection, Management and Metering”. Dr Hayek enumerated the various benefits of installing digital metering:

- “it enables the identification of where the theft is taking place by allowing you to pinpoint exactly the apartment …EDL does not know where the theft is taking place; EDL can only state that there is a lot of demand being placed on a certain substation but the exact location remains a mystery;

- The technology offered by the Meters allows the count of the stolen power. So besides taking all legal steps to apprehend the perpetrators, EDL can also bill consumers for the electricity that is being stolen;

- Meters allow you to cutoff the electricity when you want without sending someone there to physically do it;
• Meters allow you to avoid corruption and bribery since there are no humans involved;
• Meters allow you to establish credit worthiness to the system... Today, people are reluctant to invest in electricity because the system is corrupt. If the system is transparent and you can control billing and collection there will be more people willing to invest;
• Meters allow easier and more specific rationing, that way EDL can avoid cutting off electricity for the entire city, and can spare certain establishments like hospitals etc…;
• Meters can create space for water meters as well, enabling the control and billing for the water supply and controlling the waste of water."

However, Dr. Kamal Hayek was against the aforementioned project affirming that “it does not matter how intelligent these meters are… they will not solve a purely political problem which is the access to some neighborhoods”.

d. Legal Issues

HE Dr. Sami Haddad explained the main reason behind the delay in applying Electricity Law “the main issue, is the effect of the constant change in ministers of energy on the restructuring of EDL. Every time a minister comes to office he takes a few months to study the electricity file with his consultants and advisors… then he comes up with a new plan for restructuring… and by the time they start implementing it… the government changes… and the process starts all over again… Seven ministers have been appointed since the enactment of the electricity law: Minister Mohammad Abed el Hamid Beydoun, Minister Ayoub Hmayid, Minister Maurice Sehnaoui,
Minister Bassam Yammine, Minister Mohammad Fneich, Minister Mohammad El Safadi and finally Minister Alain Tabourian.”

Interviewees mentioned that all the inconsistencies in the electricity law could be corrected in an amendment of the law in order to pave the way for establishing a really open and competitive electricity market.

e. Investment Climate

The respondents discussed the main risks and threats that should be acknowledged and properly addressed by the Lebanese Government to attract the private sector to invest in the Electric Power sector:

- The political risk: The present political situation in Lebanon engenders significant uncertainty for potential investors;

- The credit risk: The bad financial situation of EDL makes it non-creditworthy and the investors would ask for the guarantee of the State;

- The foreign exchange risk: Private investors are usually concerned about the impact of the upcoming debt service on the Lebanese Pound

- The Fuel supply risk: investors in new power plant would be reluctant to invest in Lebanon because of the uncertainty in fuel supply as a result of the regional political issues with gas pipelines

- The Regulatory risk: investors are concerned about the lack of clarity with power sector regulation. There is uncertainty regarding the regulation of competition, the potential structure of the Lebanese Electric Power Sector etc…
f. Regulatory Authority

All of the respondents except Mr. Ziad Hayek agreed that appointing the regulator should be the first step of the restructuring reform. Mr. Wissam Zahabi stated that “The Electricity Regulatory Authority (ERA) is very important; any interact between the government and the private sector should be done through the regulator.”

However, Mr. Ziad Hayek argues that “there is one issue concerning the regulator and which is that Electricity law says that after ERA is appointed, the authority for everything in the sector is transferred to the regulator. That also includes the authority to issue licenses…We have been working on the reform program for a long period now (a year and a half). If we appoint a regulator now, all of this will stop for about a year because the regulator would want to review the entire policy for the power sector. The work that we have done so far to establish new power plants is going to stop because the regulator is going to say: I am the one who decides on power plants and I am the one who should issue licenses…Power plants need a long time to be built (3 to 4 years) and the sooner we start building them the better… What we have seen with the Telecommunication regulatory authority is that it takes almost a year to find their bearings, to prepare their offices, to recruit appropriate staff, to do budget, internal procedures, financial procedures. They have to meet, to do a lot of discussions, post their policies, position them on the internet and get everybody’s comments. All of that takes time… So if ERA is appointed now, this will delay the reform for about a year. We are asking for an amendment of the Electricity law which at least gives the authority of granting generation licenses to the Council of Ministers for a period of one year after the appointment of the ERA.”
When asked about the conditions for an efficient regulatory framework, Dr Kamal Shehadi enumerated the following criteria:

- “Independence: Regulator should enjoy independence in decision making to ensure neutrality;
- Power of Regulator: Powers are needed to implement regulatory decisions and will have to include sanctioning powers;
- Scale of Resources: Lack of needed resources can lead to delays or bad decision making;
- Transparency: Transparency is critical to ensure accountability of regulator;
- Consultation: Consultation should be required of regulators and is critical to good governance and to reduce the asymmetry in information;
- Speed of Process: Regulator should be efficient enough to avoid delaying development;
- Dispute Resolution: Regulator should be able to intervene to settle disputes between market players.”

2. Privatization Period

As already mentioned in the “Human Resource restructuring” section, “Corporatization” is unanimously chosen as being the first step of the privatization process. The term “corporatization” is used to describe a process of transforming utility activities from an arm of Government to a corporate structure.

However, regarding the subsequent stages of the privatization process, diverging opinions were formulated.
When asked about unbundling the electric power sector, contradictory answers and formulations were provided which divided the interviewees into two groups: Those who are against unbundling and those who are for unbundling.

Interviewees that were against the unbundling happen to be the employees of EDL or the “Internal view”: Dr. Kamal Hayek, Dr. Mohammad Alaya and Mr. Mahmoud Baroud. Interviewees that were for the unbundling were the experts in the electricity privatization or the “External view”: Dr. Kamal Shehadi, Mr. Ziad Hayek, Mr. Wissam Zahabi and HE Dr. Sami Haddad.

Mr. Wissam Zahabi mentioned that “electricity sector in Lebanon should be unbundled as per electricity law… there should be a separation of generation, transmission, distribution and supply activities.” However, Dr. Mohammad Alaya stated that “EDL should be turned from a public sector entity to a joint stock company owned by the government… internally EDL can have generation, transmission and distribution separated on accounting basis.” Mr. Ziad Hayek criticized the “internal view” by saying “This is contrary to law 462….It shows no reform and no transparency.”

All of the respondents agreed that private sector participation should be in the generation and supply components of the power sector whereas transmission and distribution networks are natural monopolies and should remain owned by the government.

However, interviewees disagreed on the methods of private sector participation in generation and supply.

Concerning supply, the “Internal View” opted for private sector participation in the supply function through management contracts. However, the “External View” preferred to introduce competition in the sector through creating several supply companies. Dr. Kamal Shehadi stated “Lebanon has already an experience in
privatization of supply through the concessions... The first thing to be done is to turn the concession into a Long term permit and specify the location where they should operate and give them several years to invest... Then the country should be divided into 10 to 15 zones... and we should have an auction on each zone.”

With respect to generation reform and privatization, the short run was previously discussed in the “technical restructuring” section; the medium term model proposed by the external experts were contested by EDL management.

In fact, Mr. Ziad Hayek proposed that in the medium term “we should get the private sector involvement in building power plants... Local investors (‘Kahraba Aley’, ‘Kahraba Zahle’, ‘Kahraba Jbeil’...) are all interested in building power plants in Lebanon and they will be financed by local banks... The financing is still available to these investors even after the financial crisis because local banks know the local environment and they are comfortable with it... Minister Safadi has already signed a memorandum of understanding with these companies... however the current minister is against this project so it was not applied”. Dr. Mohammad Alaya criticized the abovementioned proposal basing himself on the following argument “if we signed with the private sector to buy electricity from them, this will commit the government for the next 20 years... There are two risks: The first one being the probable technological advancements in the future that will bring down the cost of generating electricity; and the second one being the expected a high price for that electricity” and he proposed as a medium term solution to purchase 10 small generators, each having a nominal capacity of 80 MW. Mr. Wissam Zahabi refuted Mr. Alaya’s argument by saying “electricity has been around since the 19th century, there are no new technologies and nobody is talking about new technology that is going to come online anytime in the next 10 years or
so…concerning the second argument… contracts with Independent Power Producers (IPP) are cost plus… We should negotiate the profit margin with the private sector, through a tender…. we will open it up to everybody and say ‘who is going to give me the cheapest electricity’ based on a profit margin… Moreover, in the contract with any private company, the price will not be a fixed price per KWh. The price is a complex formula that takes into consideration many things, even on a daily basis: the temperature of the air, the humidity in the air, the temperature of the cooling water in the sea; and on top of that I will add a profit margin. It is not like I am locking myself into a 20 year price.”

In the long term, the respondents all agreed that a study should be made taking into consideration the different generation technologies and fuel options to decide what type of plants should be constructed. However, the “Internal view” declared that according to a study by the World Bank, it is cheaper for the government to build a power plant than to do it through Independent Power Producers (IPPs) since the cost of debt to the government is less than the Weighted Average Cost of Capital for a private sector project where you have both cost of debt and cost of equity. Mr. Ziad Hayek refuted the argument on the basis of:

• “Cost of building a power plant by the public sector is not the same as building it by the private sector;

• The World Bank study does not take into consideration all the risks associated with the project. If you factor in the Lebanese government’s ability to finish the project ‘on time’ and ‘on budget’, then you find that it is even much more expensive than the equity component;
• It is true that the government would have to commit to purchase electricity from the power sector and therefore there would be a contingent liability on the government. But the impact of this contingent liability is a lot less on the financial markets than what would be the impact if the government had to spend the Capital Expenditures (CAPEX) to do the plant in the first place. If the government is spending the CAPEX to build the plants, this means that they have to borrow up front. This will add to the cost of funding not only on the amount that is being borrowed but they will be an impact of a few basis points on the entire debt of the government. This impact is also not factored in the World Bank study.”

B. Discussion and Recommendations

The electric power sector of Lebanon is in a critical condition, which if not addressed urgently and correctly by the political and legislative authorities, could lead to developments that could slow the growth of the economy, damage prospects for attracting private investment, and worsen the technical problems of the sector.

Starting 1996, the Government began to fully assess the gravity of the Lebanese Electric Power Sector (LEPS) situation. The Government realized that private sector contribution was much needed. Lebanese economists who encourage privatization base their arguments on the following:

• The relief from the financial incumbency: Cash deficits incurred from State Owned Enterprises (SOE) has forced the Lebanese Government to incur huge loans and contract major debts. Such Cash deficit results from both incapacity to cover expenses and from the accumulation of interest on debt.
The relief from the administrative incumbency: The Administration and management of the SOEs is inefficient and poorly adopted which is mainly due to the understaffing in the managerial positions and the miss-appointments for the administrative positions which are not generally done according to merit.

An “income generating” instrument that lowers the budget incumbency: The sale of the SOEs by privatization would generate a cash inflow allowing the Government to cover part of the budget deficit.

The enhancement of SOEs performance: The private sector will amend the administration of the previous SOEs, bringing new personnel to introduce technical expertise needed on managerial, accounting, administrative, and technical levels and numerous skills currently lacking in the SOEs.

The creation of a competitive environment: the involvement of private sector generates fierce competition which would result in a decrease in prices, which would surely impact positively the Lebanese market and economy;

The search for new markets and sectors to attract both local and foreign investors;

The creation of new jobs: privatization will create new jobs, encouraging the Lebanese not to emigrate;

The development of the Capital Markets: The launch of Initial Public offering within the privatization process will increase the trading volume on the Beirut Stock exchange;

The enhancement of the quality of services to customers: In a competitive environment, privatization will ensure better quality for the customer since companies will try to differentiate themselves from their competitors to gain more market share;
• The implementation of new technologies: in a competitive environment, companies will have to invest in new technologies to be able to offer better service than their competitors.

However, to embark immediately on the privatization program would lead to negative impacts such as under evaluation of assets, lower revenues and private monopolies. Therefore, prior to private sector participation and in order to attract good transfer conditions of part of the sector to the private sector, EDL must be deregulated (structurally organized) to enhance its financial capabilities and performance. A complementary measure essential for the success of privatization is competition which requires separate political initiative.

We based ourselves on the literature review and on the results of the interviews to propose to the Lebanese government a detailed model for the restructuring and privatization of Electricite du Liban.

The process is divided into four sections: Corporatization, Divisionalization, Unbundling and Private Sector Participation. (Appendix 2)

1. **Corporatization**

The “corporatization” is the starting point of the process. EDL is transformed from a public institution into a state-owned joint stock company subject to the Lebanese Commercial Code with the assistance of a duly empowered consultant and an independent Steering Committee.

The rationale behind the “corporatization” is:

• granting of independence and financial means to the company to conduct the restructuring process;
• accountability of the management for acts and omissions;
• need to clear questions like the assumption of the liabilities of EDL;
• availability of financial statements approved by independent auditors,
transparency of financial situation;
• creation of the required institutional capacity in EDL.

a. Due Diligence

A thorough and comprehensive analysis of EDL is essential. It will be required
as part of the “corporatization” process, to determine the financial needs of the
company, its assets and liabilities, and to appraise the ongoing projects. The analysis
should be done prior to the upcoming “divisionalization”, where one crucial issue would
be the allocation of EDL’s personnel and assets in the different divisions.

i. Financial Due Diligence

The financial due diligence consists of a thorough assessment of the financial
and economic performance of EDL as well as the clarification of necessary conditions
and key prerequisites for the financing of the required investments as well as the
running operations.

In order to form a proper view on future “corporatization” and on functional and
potential legal unbundling (third step) it is essential to carry out a value assessment of the:
• Generation assets;
• Distribution, transmission, supply; and
• Other assets.
Moreover, an analysis of the financial strength of EDL’s balance sheet needs to be carried out that is the financial situation of the utility with its associated units as well as the cash flow implications of operational business for EDL and its units, including assessment of the risk of delayed payments for power purchased from the plant. Also, an assessment of the impact of the restructuring process on the cash flow of EDL, on its debt situation as well as its remaining financial capability after servicing the liabilities should be done.

Furthermore, the losses generated due to the actual tariff system as well as the subsidies and the welfare tariffs need to be analyzed thoroughly through the identification of the losses due to poor economical performance of EDL, and those due to the policy of the Government granting subsidies to poorer households or privileges to specific groups or institutions.

ii. Legal Due Diligence

The legal Due Diligence encompasses on one hand the review of the legal framework for the electricity sector in Lebanon in order to take account of “corporatization”, unbundling and further corporate modernization of EDL as well as privatization of some assets.

On the other hand, legal matters as contracts, licenses, concessions, rights and liabilities have to be assessed for inherent impediments or risks for the unbundling and potential privatization process.
iii. Assessment of Management Efficiency

The management efficiency need to be assessed that is the analysis of current management approaches in EDL in anticipation of potential improvements and enhancements through the choice of proficient, up to date management methods. Decision making processes should be surveyed to evaluate their adequacy and rapidity, and to study the allocation of responsibilities between the different parties and the flow of information within the institution. Moreover, the different options for management information systems and for suitable planning need to be analyzed and a target structure needs to be developed. The restructured SOE will require a change in the culture among management and employees. In fact, empowered by management, employees would be able to satisfy in the future, EDL customers which would be much more demanding. However, the most challenging task would be to shift from the current “command and control” management system to leadership behaviors allowing staff to function more efficiently and productively. Senior managers should possess certain skills to be able to lead EDL out of its static, regulated past and into the dynamic, deregulated future, including:

- Setting and sustaining a compelling direction
- Aligning people (resolving conflicts…)
- Negotiating and inspiring
- Stabilizing and supporting

b. First Amendment of Electricity Law

As mentioned in the earlier sections, the Electricity Law only distinguishes the activities of generation, transmission and distribution, but it does not identify the
activities of system operation also known as national Control Center or of supply. Moreover, the existing provisions of Law N° 462 do not allow for the incorporation of EDL as a single entity continuing generation, transmission, distribution and supply activities. Therefore, and in order to transform EDL into a corporate entity carrying out all those four activities, it is necessary that Law N° 462 be amended.

c. Establishment of the Electricity Regulatory Authority

The Electricity Regulatory Authority should be established based on the provisions of the electricity law.

The main functions of regulatory authorities deal with: (i) ensuring open access to networks, which includes the establishment of network pricing, approval or arrangements or conditions for access to the networks, monitoring of quality of service; (ii) Settlement of disputes between market players and handling complaints of consumers and (iii) Issuance of licenses and authorizations to public sector for generation and distribution of electric power.

d. Establishment of the National Control Center (NCC)

The NCC should be established. As mentioned before, the NCC carries out the complicated task of collecting effective and reliable data on electricity generation, transmission and distribution for the assessment electricity-demand and network load management.

e. Rehabilitation of Zouk and Jieh Power Plants

The two existing power plants Zouk and Jieh (around 40% of Lebanon’s current electricity supply) should be rehabilitated without delay as a cost effective strategy to
increase the available capacity in the short term. The rehabilitation should be made on a
Built-Operate-Transfer basis (BOT). The Private sector takes over the operation and
refurbishing of Zouk and Jieh for a certain period and then ownership of the power plants
is transferred back to the government. The World Bank estimates that rehabilitation of
these plants would extend their operational lifetime by ten additional years.

2. Divisionalization

As mentioned in the previous sections, EDL today is headed by a Board of
Directors and the General Director. Ten directorates share the whole range of tasks of
the company. Four of them are in charge of the technical operations of the Institution:

- generation (production)
- transmission
- distribution (2 directorates, including the supply functions at a time).

The other directorates perform administrative, support or service tasks.

![Fig. 19 Current Organizational Structure of EDL](image-url)
a. Creation of Divisions at EDL - First Step

In this stage, EDL is still headed by the Board of Directors and the General Director.

However, the administrative and supporting tasks are performed by a new “Administration and Support Division”, who administrates the whole entity and supports the operative Divisions, by means of the Human Resources Department, legal support, studies, General Control Department etc.

The Operative Divisions focus on

- generation (heading the operation of all power plants)
- transmission (operation and maintenance of the transmission system)
- Distribution (of electric power to the clients) and supply (administration of the contracts with the clients).

Fig. 20 Creation of Divisions EDL – First Step
These organizational changes are integral part of a restructuring leading to improvements in the management and financial results of EDL.

Administrative procedures, organizational structures, the IT-system will be brought into question and remodeled, improved, renewed when necessary.

The corporatized company is independent and profit oriented, so that efficient operations will be aimed at.

For financial transparency and the allocation of profits and losses, the operations between the divisions are based on transfer prices for goods and services. These prices will be approved by the Regulatory Authority.

b. Creation of Divisions at EDL – Next Stage

At this stage, the Operative Divisions become cost centers; they are headed by a divisional or tactical management for

- generation
- transmission
- distribution and supply.

They have their own divisional financial system, own profit and loss accounts and divisional financial statements. They operate with own budgets.

These accounts and statements are consolidated into the financial statement of the EDL (“Holding”) in the Finance Sub Division (or Department) of the Administration & Support Division.

The system operates through transfer prices (approved on a yearly base by the Regulatory Authority)
The Generation Division creates sub-divisions for the Power Plants (one sub-division or department for each PP or group of PP), where each department is a Cost Centre.

The Distribution & Supply Division consist of two sub divisions, the Distribution Department and the Supply Department.

The Divisions are financially and managerially independent and are accountable to the Board of Directors and to the General Director.

The assets and the personnel needed for the operations have been allocated in the Operative Divisions.

At this stage, the Operative Divisions are ready for corporatization.

Fig. 21 Creation of Divisions EDL – Next Stage
c. Second Amendment of Electricity Law

As already mentioned in Chapter 4, Law N° 462 need to be amended to include rules about:

- Opening of the market: allowing consumers of electricity to freely choose their supply;
- Authorization procedure where anyone could, at any time, request an authorization to construct a generation plant and which is considered the most transparent and efficient mechanism to promote the installation of new generation capacity and to develop competition in the power generation market;
- Third party access system: a non-discriminatory system of access to the transmission and distribution networks.

d. Analysis of Tariff System

The tariff system must be reviewed. A system of cost covering tariffs should be taken into consideration. However, increasing the tariff will undeniably be politically and commercially challenging. Therefore it should be phased in a progressive manner and should be accompanied by social protection measures to mitigate adverse impact on underprivileged consumers. This could be done by welfare subsidies for poor households or those qualified as “economically vulnerable”. (World Bank, 2008)

e. Fuel Supply strategy

A comprehensive “fuel supply strategy” should be prepared and should factor in several considerations: cost, environment and security.
According to the World Bank, the cheapest option for fuel supply is the natural gas followed by coal. Nevertheless, the least economical options are gas-oil and LNG.

Moreover, several agreements should be made with potential fuel suppliers from different countries to diversify the sources of energy avoiding any political obstacles that might arise. In fact, two government-to-government agreements has already been signed in 2002 with Syria and in 2007 with Egypt, for delivery of natural gas. However, these agreements are still pending the “completion of pipeline infrastructure in Jordan and Syria as well as concluding a gas transit agreement between Egypt and Syria”. (World Bank, 2008)

f. Completion of Transmission Network

As mentioned before, part the transmission network line that is connected to the Dimas substation in Syria through Ksara substation in the Bekaa, was not completed due to problems of neglected building rights along parts of the lines and mainly in “Mansourieh” area. However, Electricite du Liban have isolated this area and found a way to bypass it. Therefore the transmission network should be completed.

3. Unbundling

At this stage, the operative divisions can be corporatized.

Single power plants or groups of (ex. hydroelectric) power plants are corporatized into joint stock or limited companies for the later privatization process.

Depending on the policy of the Authorities, the transmission system installations are considered as strategic assets to be kept in public ownership. In this case, the transmission division can, but must not be corporatized. Nevertheless, the transmission
function is performed by a private operator (National Control Center) under rules and conditions agreed to by the Regulator.

The proceedings with the distribution function are similar to that of transmission topic. Alternatively, the distribution system can be corporatized in view of a later privatization.

The supply function (the commercial aspects of metering, billing, collection, contracts with clients) can be corporatized for a later privatization or conducted into a competitive market with other (private) suppliers.

Preconditions for the corporatization of the divisions are the implementation of a financial system capable to reproduce the divisional structure, the audited results of the Due Diligence exercise for the establishment and verification of the value and price of the companies to be privatized and agreed to by the Regulatory Authority. The corporatization of the divisions is related to opening balance sheets and specific financial statements.

Fig. 22 Unbundling of EDL
a. Billing and Collection Restructuring

Drastic measures should be applied to decrease electricity theft and illegal connections. These measures include:

- Implementation of a state of the art and efficient billing and connection system. An example of a modern system is the digital metering proposed by Mr. Ziad Hayek.

- Application of the penal Law No. 632 which states that “Electricity and Water theft and illegal connection are considered a crime penalized by imprisonment”.

b. Construction of New Power Plants

As mentioned before, the inability of EDL to meet demand effectively is due to insufficient generation capacity. Moreover, since the construction of a power plant takes around four years to be completed, the government should get the private sector involvement in building new PPs in the medium term. As proposed by Mr. Ziad Hayek, this could be completed by the local investors (“Kahraba Aley”, “Kahraba Zahle”, “Kahraba Jbeil”) which already signed a memorandum of understanding with Minister Safadi. Furthermore, these companies would be financed by local banks since foreign investors are for the time being reluctant to invest due to the financial crisis.

4. Private Sector Participation

At this stage, transmission and distribution assets should be owned by the state but can be operated by private companies, generation companies are privatized and supply function will be privatized and conducted into a competitive market with other (private) suppliers.
For Lebanon, the best model to be used for the time being is the single buyer model. (Figure 24)

The legal separation or unbundling of generation function from transmission and distribution helps introducing competition by guaranteeing equal treatment of Independent Power Producers. In fact, equal treatment is ensured when all generation companies sell their output to the transmission entity which owned by the state, the “single buyer”, ruling out direct contracts with distributors, which could unfairly favor some IPPs over others. (Lovei, 2000)

The single buyer model was chosen as a basic model for the Lebanese Electric Power due to a number of factors: (Lovei, 2000)

• The single buyer model preserves the ministry’s role in decision making and especially in issues related to the investments in generation capacity, for that reason it likely to be favored by the government;
- The single buyer model simplifies price regulation by maintaining a “unified wholesale electricity price”;
- The single buyer model protects investors in generation projects from “market risk and retail-level regulatory risk”, reducing by that the investments costs;
- The single buyer model appeals to politicians who are usually reluctant to support the sector’s complete withdrawal from government ownership.

Fig. 24 Single Buyer Model
CHAPTER VII

CONCLUDING REMARKS AND FUTURE CHALLENGES

All over the world, the electric power sector is a sensitive infrastructure that is directly linked to the different daily activities of the public. However, unlike all other countries, the power sector in Lebanon has become an extremely sensitive issue presenting great concern and apprehension to its citizens.

The various performance indicators for the LEPS have pointed out the extent or the degree of accumulation of problems hindering and threatening the primary operations of the sector, and inflicting substantial damages to the Lebanese Economy.

The Government of Lebanon has been confronted with three challenging tasks: to restore and upgrade plant and equipment out of operation or in bad condition since the civil war; to reliably meet current demands for the various forms of energy; and to prepare the sector for the future requirements of an economy with prospects to grow in a competitive world.

The Government should be able to turnaround the performance of the electricity sector through the adoption and gradual implementation of rooted reform policies.

This paper provides a comprehensive reform proposal for the Lebanese Government focusing on four major restructuring steps or “milestones” for the LEPS leading eventually to the privatization of the generation and supply activities. This proposal is inspired from the literature review as well as insights from the interviews.
The problems facing the electric power sector are not unique to Lebanon. In fact, the insufficient tariffs, the lack of generation capacity and the back-up generation have characterized many power sectors in developing countries.

However, the main exceptional challenge in Lebanon is the difficulty for the policymakers to agree on a single method to improve the power sector including the extent of private sector involvement in the sector, and to figure out how to embark on the initial steps. In fact, fixing and restructuring the LEPS was on the agenda of the last six or seven ministers of the MEW. However, as of today only limited achievements were effected.

The lack of common goals and objectives amid the major stakeholders was the main reason of the resistance to change. A poorly-performing power sector in a developing country usually goes beyond basic technical issues. Indeed, it is often related to the fact that there are multiple parties benefiting from the “dysfunctional status quo” of the power sector. These benefits range from corrupt deals and illegal kickbacks, to buying of votes through providing free electricity, to abusing energy shortages. (World Bank, 2008)

Hence, unless LEPS is restructured while political interference is far from the restructuring process, than the sector will remain “a massive drain on public resources and a symbol of Lebanon’s profound challenges of governance, inclusion and accountability”. (World Bank, 2008)
APPENDIX I
INTERVIEW QUESTIONNAIRE

Section 1: Pre-Privatization period

A. Financial Restructuring

1. There is no transparency in EDL financial figures. There is no reliability in the figures provided. What is the solution?

2. EDL has a chronic financial deficit. How to reduce it for it to become a financially viable institution?

3. Since price of oil is elevated, why not using alternative cheaper energy resources (coal, natural gas…)? The two plants Deir Ammar and Zahrani function on natural gas. Why the gas pipelines are not completed yet?

4. Tariffs are fixed since 1994 and are based on oil prices at that date which varied between US$ 25 and US$ 30. What is the solution? Should the tariffs increase? How to do it?

B. Human Resource Restructuring

5. Every year around 100 employees go on retirement and are not replaced since there is a freeze on hiring new personnel since 1985. How to ensure the continuity of work in the short term or during the restructuring period?

6. What will be the impact of restructuring on employment? Will it be any layoffs? How to minimize labor resistance?

C. Technical Restructuring

7. Every year, electricity demand increases 6% on average, however, electricity generation is not increasing. This is leading to electricity rationing all over the Lebanese territory. How to cure electricity supply shortages?
8. The transmission network is not yet completed. Therefore, even if generation is enough to cover electricity demand, not all of the generated power will be supplied to consumers. What is the solution?

9. What is the role of the National Control Center? Why it did not it start working yet?

D. Legal Issues

10. Electricity law no. 462 was enacted in 2002, why wasn’t it applied yet?

11. Electricity law no. 462 contains many inconsistencies. Moreover there are key issues that are not included and that are necessary to promote competition (distribution and generation are not separated, no corporatization, there are entry barriers for new generation companies, there is no opening of the market, supply and system operation are not defined…). What should be done?

E. Investment Climate

12. How to create a proper investment climate to attract foreign investors?

13. How to minimize political interference and corruption on the restructuring and the privatization process

14. What is the role of international courts in dealing with disputes between the government, the consumers and the private sector?

15. What are the government’s guarantees to deal with problems such as theft, illegal connections and refusal to pay electricity bills? Will the government apply the “Water and electricity theft law”?

F. Regulatory Authority

16. What is the role of the Regulator?

17. What will it regulate? Tariffs? Based on what method (price cap)?

18. Should the regulator be appointed in the pre-privatization period or during privatization?
Section 2: Privatization period

19. Should the electricity sector be unbundled? Horizontal unbundling or vertical? Or both?

20. If it was unbundled what parts of the sector should be privatized? Generation, transmission, distribution, system operation or supply?

21. What privatization method should be adopted (management contract, leasing, concession, divestiture…)?

22. What structure of the electricity market should be adopted (single buyer, retail competition…)?
Complete Restructuring Process of EDL

**Indicators for the achievement of the phases**

- **Transformation of EDL into a S.A.:** Transformation of EDL into a S.A.
- **Reorganization of EDL:** Reorganization of EDL; conversion into administrative and operative divisions
- **Transformation of operative divisions:** Transformation of operative divisions into joint stock companies
- **Offer for sale:** Offer for sale of generation companies to private entities enabling market access to independent power producers
- **Market access for private suppliers:** Market access for private suppliers

**Legend:**
- **Red triangle:** Milestone
- **Green triangle:** Activities leading to the Milestones

**Stages:**
- **Corporatisation**
- **Divisionalisation**
- **Unbundling**
- **Private sector participation**
START

Corporateisation

EDL is corporatized

Divisionalisation

EDL is divisionalized
(Cost Centres are implemented)

Unbundling

The Divisions are Corporatized
(legal unbundling)

Private sector participation

Organizational activities

Establishment of the Steering Committee
Recorreadization, creation of divisions

Due Diligence exercise
Concession of administrative autonomy, allocation of assets and personnel

Start of restructuring and reorganization
EDL operates like a private company; efficient, profit oriented

Corporatization process of EDL
Establishment of divisionalized management, financial system etc.

Rehabilitate Zouk and Njeh Power Plants

Technical activities

Construct new powerplants

State-of-the-art billing & collection system

Reorganisation, definition of cooperation rules and transfer prices

Switch to new accounting system

Corporation process of the divisions

Sale of (some or even all) power plants to private investors

Contract private operators for transmission and distribution
START

Corporatisation

EDL is corporized

EDL is divisionalized
(Cost Centres are implemented)

The Divisions are Corporatized
(legal unbundling)

The Private Sector participates

Divisionalisation

Unbundling

Private sector participation

Assumption of liabilities

Concession of financial autonomy

Analysis of the tariff system: cost covering tariffs, differentiated from social transfer payments

1. Amendment of Law 462 to: a) allow incorporation of one single entity, b) legal basis for Supply and System operation activities

2. Amendment of Law 462. Inclusion of: Rules about Third Party Access, Opening of the market, consumer protection, etc.

Detach divisions' financial system

Legal activities

Financial activities

3. Concession contracts and licenses for new operators
Start

Corporatisation

EDL is corporatized

EDL is divisionalized (Cost Centres are implemented)

The Divisions are Corporatized (legal unbundling)

Private sector participation

Electricity Regulatory Authority

Establishment of ERA

ERA guarantees the right of access to the public grid and the smooth development of the electricity system. ERA regulates the market (public service, entry of new producers, consumer protection)

ERA is effective and approves transfer prices for interdivisional operations

ERA approves the allocation of assets and the legal, financial and managerial corporatization based on the results of the DD

National Control Centre

Establishment of the NCC

The independence of NCC is guaranteed by ERA


Ernst andYoung, “Assistance in the Restructuring of the Electric Power Sector in Lebanon”, 1995


Republic of Lebanon: Law No. 228: Regulating privatization’s operations and defining its terms and fields of implementation. Baabda, 31 May 2000

Republic of Lebanon: Law No. 462: Regulation of the Electricity Sector. Baabda, 2 September 2002


Electrcte du Liban Website, available from [www.edl.gov.lb](http://www.edl.gov.lb)
