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## **Water and electricity networks between stress and reform: from post-civil war reconstruction to the new Lebanese wars**

Eric Verdeil

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After the 2006 summer war and the 2007 assault of Nahr el Bared, the issue of energy and water supply is once again one of the main issues the Lebanese have to cope with. It is a consequence of the damages inflicted by both conflicts (mostly during the 2006 war) as well as a result of the State paralysis, which is hindering the necessary reforms. But, to be honest, the recovery of the energy and water delivery, deeply affected by the civil war (1975-1990), has never been fully achieved during the reconstruction process. Strangely, while the crisis of these infrastructures has been recognized as one of the dimensions of the civil war urban crisis (Awada 1988, Davie 1991), urban scholarship has mostly overlooked the public service supply issue during the 1990's.

In this paper we would like to address it and, specifically, to understand how the water and electricity supply is linked to the process of territorial fragmentation in post civil war Lebanon. Since the end 1990's, several attempts at reforming both sectors have been launched. They seem to be part of a wider global trend of neoliberal reforms affecting urban utilities. Since the social and territorial impacts of such reforms are usually strong, we will also try to assess their effects in the Lebanese cities. Lastly, we have to examine how the recent cycle of violence and of political unrest has heightened the problems, which is one of the currently most disputed political issues.

## **The networked infrastructure's crisis and territorial fragmentation: a framework for analysis**

While few academic works have dealt with that issue in Lebanon, networked infrastructure has been an important theme in the last 15 years for urban research, particularly regarding the so called developing countries. It has been shown that "Urban networks in the contemporary city are largely hidden, opaque, invisible" and that "the hidden flows and their technological framing render occult the social relations and power mechanisms that are scripted in and enacted through these flows" (Kaika, Swyngedouw 2000). In this respect, by focusing on such utilities in Lebanon, we expect to bring to light how the inequality of supply between regions and social groups is not the result of technical hazards but a revelator of socio-economical discrepancies, and the product of political regulations regarding the provision of water and electricity.

The current reforms of utilities management can be regarded as part of a global trend of the implementation of neo-liberal policies. The book *Splintering urbanism: Networked Infrastructures, Technological Mobilities, and the Urban Condition* (Graham, Marvin 2001) has been a landmark in literature and its main assumption has led to many works. It maintains that 'a parallel set of processes are under way within which infrastructure networks are being 'unbundled' in ways that help sustain the fragmentation of the social and material fabric of cities" (Graham and Marvin, 2001, p. 33). It is therefore interesting to understand to what

extent the reforms of the Lebanese water and electricity sectors look like the neoliberal transformations analysed by these authors and then, how do they nurture the social and spatial fragmentation process.

Some scholars have questioned the relevance of Graham and Marvin's main assumptions for developing countries. They have noted that, contrarily to industrial countries, one could hardly find in the history of most developing countries any signs of an integrated management of the basic infrastructure (that would then be unbundled). And they also state that it would be erroneous to depict the cities of developing countries as splintering while they had always been splintered (Coutard, 2008). The Lebanese history does not differ in that respect. Yet, the development policies of Fouad Chehab, President of the Republic (1958-1964) sought to achieve the universalization of basic infrastructure and much progress had been accomplished in the following years. But the Lebanese civil war (1975-1990) has broken that effort and reversed the trends on the ground. Infrastructure provision has been used as a political weapon in the hands of the militias that controlled the fragmented country. The delinquency of the management has led to the development of informal and substandard provision means, like electrical generators, private wells or private water supply (Awada, 1988; Davie 1991). During the reconstruction years, though massive investments in electricity and water infrastructures, the effort has been spatially unequal. Many Lebanese cities (and even more, the countryside) have not benefited of such investments. Rather than resulting in a national upgrading, the rehabilitation policies (new infrastructural work) and the management of networks policies (tariff, fees collections, theft repression) have added new layers of differentiation between regions and cities (Verdeil, Féré, Scherrer, 2009). The fragmentation of basic services supply then is a long term process.

Because of the limited room allowed to that paper, its purpose is not to analyse in detail the policies of the reconstruction years, and particularly does not explain the technical, financial and managerial reasons of the shortages in electricity and water. It firstly provides a few indicators revealing the spatial discrepancies related to water and electricity and, then, moves to a presentation of the recently implemented reforms, in order to understand their social and spatial impact.

The article draws on fieldwork conducted in Lebanon during the years 2005-2007 where a range of stakeholders have been interviewed. We also gathered various statistics from the ministry of Energy and Water, the utilities and the available statistical compendium. The data were complemented by a press review from *The Daily Star*, *L'Orient Le Jour*, *Le Commerce du Levant*, more sporadically from the Arabic press and from various information web sites.

## **Urban services and urban fragmentation in Lebanon**

### ***The situation at the beginning of the 2000's***

The uneven supply of urban services is a major dimension of urban fragmentation in the Lebanese cities, and notably in the main ones. It is a reality which is under-researched, especially if one compares it with the relative abundance of analysis of confessional segregation in the cities, or segregation processes linked to the implementation of urban projects and planning like for instance the development of shopping malls or megaprojects like Solidere. The overlooking of this question in Lebanon doesn't reflect the importance of this topic in the urban studies in other areas of the developing world.

The difficult access to urban services and the struggle for alternative supply sources is a daily experience shared by all the Lebanese since the war. This is may be overshadowing the

inequalities among the Lebanese people. Still, important differences between the cities and neighbourhoods in the supply of State produced services (like fresh water and electricity) are to be found. Alternative access to these services is possible - often informal - but, again, at the price of geographical and, most notably, economical discrepancies between places and individuals.

The power sector provides a first example of such differences on three aspects: the administrative organisation, the quality of the supplying, and the cost for the customers.

### Different entitlements to urban services

The first point to be mentioned is the legal status of households regarding access to electricity. The development of illegal settlements in Beirut and in other major cities during the civil war resulted in an administrative impossibility to connect those houses to the electricity network, since the administration had not granted the illegal dwellers the legal paper requested by law in order to be connected. But, over the time, refugees and some of the residents of illegal settlements have been granted a temporary access to the network, through a circuit-breaker that allows a 10 A delivery (*izn isthlak*) at a fixed price. Officially, such a connection was granted only to refugees whose status was certified by the *moukhtar*. But fieldwork surveys suggest that the *maqtu'iya* as it is called is far more widespread and that Electricité du Liban (EDL) has allowed more people to get connected in order to collect more bills (Khayat, 2008). Data provided at EDL for the year 2006 shows that about 4000 households and 3100 shops and workplaces in Dahiyeh, Beirut's southern suburb) were granted such connection. The figure seems to be on the rise<sup>1</sup>. As it does not match the number of illegal houses in the suburbs, it probably means part of the households there are not connected to the grid and therefore get their electricity supply fraudulently<sup>2</sup>. Interestingly, according to official statistics published by the Central Administration for Statistics (CAS), 100% of the households in the country are connected to the grid, which overstates the reality of electricity delivery in popular and contested settlements.

Table 1: Customers with circuit breaker (permission to consume, *izn isthlak*) (June 2006)

| EDL District          | Residential | Non residential | Total      |
|-----------------------|-------------|-----------------|------------|
| Antelias <sup>3</sup> | 139         | 1458            | 1597       |
| Chiyah <sup>4</sup>   | 3952        | 3109            | 7061       |
| Lebanon               |             |                 | About 9000 |

Source: interview, EDL, June 2006.

The provision of the inhabitants of Palestinian camps is another case – and might differ from one camp to another. Because of the refugee status, the supply of the Palestinians living in camps can only be granted on a temporary basis, and under the auspices of UNRWA, the UN agency in charge of the camps. In the camp of Shatila, south of Beirut, electricity is supplied to the inhabitants through a similar system of *izn isthlak* (with circuit breaker of 5 or 10 A for a monthly lump sum). But the first subscription, in 1993, had been subsidised at 90% by UNRWA who managed the negotiation with EDL. The Popular committee of the camp is the effective responsible of the fees' collection and the technical management inside the camp. During the end of the 1990's and the beginning of the 2000's, EDL complained that UNRWA was indebted, and punished several times the inhabitants collectively and not on an individual basis, as was the case in other places where households supplied with a circuit-breaker. Though the access to electricity was made possible through a similar technical device, the

<sup>1</sup> Interview with an engineer, EDL, Beirut, June 2006.

<sup>2</sup> In the Elyssar area only, the number of illegal households was estimated in 1991 to about 13000 (Clerc-Huybrechts, 2002).

<sup>3</sup> EDL name for the district including the eastern and northern part of Beirut's suburbs.

<sup>4</sup> EDL name for the district including the southern part of Beirut's suburbs.

management thus was managed according to a specific rule and by specific actors<sup>5</sup>. An important number of inhabitants have no circuit breakers and have made hook-ups on the poles.

The legal entitlement to electricity in the Lebanese cities is linked to the legal status of the residence. The dwellers of illegal settlements have no entitlement to electricity (and water) from the public network. Exceptions and temporary supply are granted for displaced persons. The Palestinian refugees in camps have another entitlement, through the UNRWA, with the same technical system. An unknown number of inhabitants thus cannot legally receive supply of electricity (which does not mean that all people making hook-ups are in that situation).

### Geographical and socio-economical contrasts in the access to electricity

Though considerably improved from a 6 hours per day supply after the civil war, the effective delivery of electricity in Lebanon never went longer than 22 hours a day at its best in the end of 2004. This came along with noticeable differences between the capital city, Beirut, with an almost full time service, and various places in the country, sometimes less than 20 h a day. Considering their closeness, the difference between the capital city and its suburbs has a strong symbolical significance, highlighting their contrasting quality of life.

Table 2: Duration of power delivery in hours in the Lebanese districts

| Reference period       | Beirut | Antelias | Chiyah | Mount Lebanon (except Beirut and suburbs) | South Lebanon except Marjayoun | South Biqaa, Zahleh, Anjar, Marjayoun | North Biqaa and Zahleh's suburbs | Tripoli Chekka Ehdén Bcharri, Koura and part of Zgharta | Akkar Dennyeh Minieh part of Zghorta, Batrun |
|------------------------|--------|----------|--------|---|--------------------------------|---------------------------------------|----------------------------------|---|--|
| Mean supply in 2004    | 23,83  | 21,71    | 21,32  | 21,09                                     | 19,74                          | 20,43                                 | 20,3                             | 22  | 20,38  |
| Supply in January 2008 | 21,25  | 16,25    | 14,75  | 15  | 15,75                          | 15                                    | 15,25                            | 16,75   | 16,5   |

Source: EDL (2005); EDL quoted by *L'Orient-Le Jour* (2008)

The shortage also has financial consequences for the inhabitants. According to a 2004 survey, 38% of the households are using private generators at the household, the building, or the neighbourhood level. Regional differences are to be observed. We lack recent detailed data but in 1996, the ACS data showed that inner-city Beirut was much more equipped with building-generator than the suburbs, although the delivery was already better in the capital. It suggests that the use of a generator is related to the socio-economical status of the households. Indeed, another 2004 survey shows that the electricity cost is heavier for deprived households than for healthier ones (table 3).

Table 3

|                              | Deprived households (less than 250 \$ per month) | Rich households (more than 2000 \$ per month) |
|------------------------------|--|---|
| Mean cost of the EDL bill    | 25\$ ie about 10% of the income                  | 72 \$ ie about 3,4% of the income             |
| Mean cost of the generator's | 14 \$  | 25 \$   |

<sup>5</sup> These informations come from : Karim Eid-Sabbagh, Amr Saededdine, 2005, "Shatila's services and autonomy", Report of Phase 2/URPL629, Master of Planning, American University of Beirut, 20 p. The authors

|            |                      |                      |
|------------|----------------------|----------------------|
| bill       |                      |                      |
| Total cost | 40 \$, 17% of income | 100 \$, 5% of income |

Source : ICEA-CORAIL-IPSOS Stat 2004

### Contrasted access to fresh water

The water sector is institutionally more fragmented and it is difficult to get a comprehensive picture. First, access to the public water network seems to be less spread than for electricity, since only 85% of the households, and 88% of the urban households, have such a connection (ICEA-CORAIL-IPSOS 2004). Such low rates are a consequence of the war and the development of illegal settlement. But contrarily to EDL, water authorities seem not to have encouraged systems similar to *izn istihlak* for illegal settlements.

The delivery of water is also non-permanent. Only 49% of urban households get water everyday in winter and 29% in summer. The worst situation is for Beirut and the Biqaa. The quality is also bad. 52% of inhabitants never drink water from the public network (ICEA-Corail-IPSOS Stat 2004). Cases of contamination by germs have caused death in Tripoli in 1998 (Rajab 2006).

As a consequence, the Lebanese rely on various systems of tanking water to alleviate the shortages and they use alternative sources of fresh water for drinking (bottles, municipal fountain, private wells...). Here again, the ICEA-CORAIL-IPSOS survey show that the cost of these alternative sources of fresh water represent a heavier cost for the more deprived households.

The non-permanent and unequal delivery of water and electricity leads to socio-economical and geographical differentiations between the Lebanese, and between various neighbourhoods of the same cities. They increase previous socio-economic urban inequalities and therefore can be considered as a factor of intensified fragmentation at the urban scale. The dramatic situation of deprived neighbourhoods has been evidenced in various fieldwork surveys (Khayat 2008, Féré 2007 for instance). Conversely, emerging gated communities used the quality of service provided by private operators (like developers) as an advertising slogan: “What makes Mechref Village truly unique, however, is its complete self-sufficiency as a community. A private internal security team ensures your utmost privacy and peace, while the internal 24-hour electricity, the well system for water and private roadwork for the internal road network mean that all utilities are guaranteed, efficient and rely on the latest technologies, in accordance with the highest international standards. ([www.mechref.com.lb](http://www.mechref.com.lb), November 2005).

### Fraud and non-payment as factors of fragmentation

In response to the shaky delivery of service, fraud and non-payment have developed over the war years and have never been eradicated during the reconstruction years. The few indicators available reveal regional and geographical gaps, highlighting the informal political management of fraud. Data on theft are available only at the national scale, but not at the city level. The data show that fraudulent practices reach their maximum in regions far from Beirut (Verdeil, 2009).

Table 4 : Power “theft” (Percentage of non billed consumption and non paid bills on total electricity production). Districts according to EDL geographical organization

| Beirut | Mount Lebanon North | Biqaa South | Mount Lebanon South | South Lebanon | North Lebanon | North Biqaa | Middle Biqaa |
|--------|---------------------|-------------|---------------------|---------------|---------------|-------------|--------------|
| 12,1 % | 40,1 %              | 45,6 %      | 49,6 %              | 56 %          | 60,7 %        | 67,2 %      | 69,1 %       |

Source : EDL, August 2003, quoted in EL MUFTI, 2005.

According to interviews with EDL engineers, some areas like Dahiyeh (the mostly Shia populated southern Beirut suburbs) are also subject to strong level of fraud but mostly by small customers, whereas in Beirut and in the northern suburbs, fraud has been evidenced for big costumers like industries, shops or leisure centres, as well as for personalities. These engineers tend to minimize the social and confessional dimension of fraud: the poor and the Shias would not necessarily be the biggest cheating population, contrary to widely circulated assumptions.

The fact is corroborated by data on bill payment. Here again, the non-payment is very high in rural and mountainous areas, while Mount Lebanon reaches a relatively low level (but of course, these regions concentrate the bigger part of the customers). In the suburbs, the collection rate has fairly improved over the recent years (see below). In the water sector, the fraud rate is not known but the non-payment also reaches a high level: payment at the collector's first visit amounts to 80% in Beirut in 2001; 67% in Mount Lebanon; 60% in North Lebanon (ICEA-Corail-IPSOS Stat 2004).

The geography of theft and non-payment seems very closely linked with the de facto local powers which are prevailing in the post-Taif Lebanon. Even if the situation has improved over the reconstruction years, the relationships of patronage are preventing in most remote areas that sanctions are taken against cheating persons or non-payers (see Verdeil 2009 for a closer examination of data).

### **Unequal access to services, fragmented city**

The access to urban services not only reflects but also emphasizes the fragmentation of the Lebanese cities. At a first level, the legal status of the access to urban services creates several categories of citizens (non connected, long-time "temporary" connected or fully connected). This is reflecting the different legal and social status of urban dwellers, but it also symbolically means a diminished right to the city. The concentration of temporary and non-connected in Dahiyeh (mainly Raml, Ouzai, Jnah) is labelling them as outlaw places.

Such a stigma usually isn't related to these different categories but rather to the prevailing practices of fraud and non-payment they are considered to be the paramount of. For sure, such practices are to be found in such places but these neighbourhoods don't hold the monopoly of them. Some rural areas but also some wealthier urban neighbourhoods fall in the same category.

The timetable of services supply show great contrasts between the cities and between their neighbourhoods, while water and electricity don't have the same organization. The electricity distribution clearly favours the capital city. For water, the decentralised management makes the comparison of performances impossible, or at least, it is not linked to a single decision-making.

The financial burden weighting on the citizens in order to alleviate the non reliability in time and in quality of the urban services is not the same for all. Apart from the geographical contrast between Beirut and its suburbs, the main line of splitting is passing between the rich and the others categories. Compared to their overall income, rich people pay less for alternative sources of provision. They can also develop strategies in order to secure their supply: the growth of gated communities is clearly fostered by the provision of autonomously produced services. The urban segregation at the scale of the city is sustained by the bad performance of state run utilities.

# The private management of public infrastructures: failed attempts and fragmented Lebanese governance

The purpose of the second part is to analyse the reforms of water and electricity sectors and the first steps of their implementation. Those reforms seek to introduce, among other patterns, public private partnerships. We will emphasize the spatial differentiations such new kinds of management have introduced, in terms of relationships between the users, the utilities and the local powers.

## ***Privatisation as a solution for a failed public management?***

The continuous poor performance of the Lebanese utilities in service delivery is a matter of public debate since the early 1990's. But the issue surfaced at the top of the agenda in the late 1990's when the problem of the public debt forced the successive governments to tackle it. Indeed the debts of the various electricity and water utilities have frantically risen. In 2001, the debts of all the water utilities amounted 7% of the public debt (ICEA-CORAIL-IPSOS 2004). The accumulated debt of EDL during 1993-2006 amounts 11,6 billions US\$ (including the interests generated) (Ministry of Finance, 2008). In 2008, the Lebanese public debt amounts 42 billions US\$. We can conclude that the various utilities represent about one third of it. Regarding the electricity, the main reason of the rising debt is the surge of the oil price, while the tariff was not adjusted, but many other flaws in the management also come in line: delay in substituting the old oil processed plants by new gas units, corruption in the subcontracting works, technical losses, fraud and non-payment, etc. The water sector also suffers from a lack of investment, mismanagement, low collection rates, heavy losses, etc.

All this led the Hariri government to set up a program for privatization: a new law for the reform of the water sector was approved in 2000. It melted the 21 old districts's water agencies in four agencies at the scale of the muhafazat, and allowed them to hire private firms to operate (Ghiotti, Barakat 2006). As for the electricity sector, another law in 2002 planned the privatisation of the sector. Later steps in the reform process<sup>6</sup> foresaw that the utility should be unbundled in three units for the generation, the transportation and the distribution subsectors. Generation and distribution are to be sold to or operated by the private sector.

These legal and industrial evolutions have been strongly praised by international financial bodies, like the IMF or the World Bank, who helped drafting the new laws, as well as by national aid institutions like the French AFD or the USAid. The financial aid given to the Lebanese government at the Paris II (2002) and Paris III (2007) conferences was conditioned to the implementation of such reforms. Those various good faeries sometimes had contradictory points of view, reflecting the interests of their national firms which they backed in order to obtain them the access to the Lebanese markets. The French advocated their model of delegated management to private firms, which the Lebanese law on privatisation did not made possible. Therefore, instead of a delegation of service, it has been necessary to use a management contract in Tripoli, which allows less flexibility for the private firm. The reforms were also discussed and contested by various Lebanese stakeholders, and all had not the same objectives. Their interactions resulted in altering the water reform process (Féré 2007).

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<sup>6</sup> Every minister drafted his plan: Sehnaoui (2004), Fneish (2006), Tabourian (2009). We can not examine in details their analogies and differences but let's say that the option of introducing PPP remains a central item.



Compared to the transformations experienced in other similar countries, one can wonder why the discourse of privatisation as a solution for these sectors had not been advocated previously. Indeed, several other sectors had experienced PPP in the 1990's, like the garbage collection and treatment, awarded to Sukleen in 1994, the mobile phone awarded to Cellis and Libancell, or Liban Post. Not to mention other private sector operations in the real estate sector (Solidere, Joseph Khoury, etc...). One of the reasons probably is that water and electricity were felt being more sovereign and strategic sector, where public investment had to be implemented first in order to reform them before privatizing them. Another reason is the resistance of some of the political elites to that privatisation process, at least until a certain stage. In the recent years, Hezbollah – in the person of Mohamed Fneish, Minister of Energy and Hydraulic Affairs- didn't oppose the principle of the privatisation of parts of the electricity sector but still remains wary (Verdeil 2009). Indeed, those previous experiments have, in most cases, illustrated the tendency of the post-Taif Lebanese State to allot shares and markets under impenetrable conditions and according to political cronyism (Leenders 2004). The fact is that the process of privatisation of those two sectors is only at its beginning. Therefore it is impossible to draw give a clear picture of it. But still, it can be read as revealing a very fragmented urban governance.

### ***Privatisation in act : the case of ONDEO-Liban in Tripoli***

In Tripoli, ONDEO-Liban, a subsidiary of the world firm Suez, was awarded a 4 years management contract and had to implement the rehabilitation and modernisation of the water network, thanks to a 20 M US\$ loan by the French Development Agency (AFD). The project started in 2003 and was extended for one more year until beginning 2008.

At the end of the contract, the result, according to various sources, is contrasted and disappointing<sup>7</sup>. If the modernisation of infrastructure has been implemented (new water plant, extension of the pipes) and if the service has been improved in terms of water quality and of supply regularity, the commercial performance seems to remain weak (the rate of collection has not improved as expected) and all the more, the census of the customers and of the linking up, a much needed tool in order to eradicate fraud, has not been completed<sup>8</sup>. Another duty of the consultant was to set up the cost accounting, including the census of the water office assets. It was also missing. As a consequence, ONDEO-Liban has been sanctioned by a financial surcharge of 300.000 euros instead of receiving a bonus of 600.000 euros as was expected.

The operation of the contract has exacerbated tensions between the public client (the water office of Tripoli, later integrated in the water authority of the North) and the corporate management (for a detailed account, see YOUSFI 2006). The managers of ONDEO-Liban have complained about the tight public regulations they had to abide to, which they claimed have prevented them from implementing the contract properly. Conversely, the public client complained about not having been correctly informed of the operations, sometimes as important as the move to new offices. And they also regretted that ONDEO-Liban has subcontracted most of the operations to Lebanese firms, whose work was under the standards expected from an international company. They claimed, with some grounds, that ONDEO-Liban was seeking fast profit rather than to really implement all the contract's objectives. But the client, which was badly advised by the independent supervisor, also failed in stating in due time the flaws in the operations. Their reluctant attitude toward ONDEO-Liban reflected also

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<sup>7</sup> See comments by C. Raymond, H. Yousfi and B. Dewailly quoted in Blanc Aymeric, Hibou Béatrice, *Compte rendu résumé de la Journée d'étude. Renouveler l'analyse des Partenariats Public Privé : Approche par la sociologie. Liban, Mali, Maroc.* 31 January 2007, AFD, 8 p. [www.afd.fr/XXX](http://www.afd.fr/XXX)

<sup>8</sup> According to interviews with AFD officers, Paris, 14 th December 2007.

their professional opposition and their self representation as civil servants operating for the public good.

The motive for heading towards a private management was, among other reasons, to circumvent the practices of *wasta* (string-pulling) and of redistribution of services traditionally associated with the delivery of public service in Lebanese cities. Several conflicts showed the local resistance that ONDEO-Liban had to face during the implementation of the project. The hiring of new staff, at the very beginning of the operation, was a first occasion of clash (Yousfi 2006). Since employment in the water office was a resource of patronage, the Tripoli water office director, linked to the Tripolitan *zua'ama*, opposed strong resistance because he hadn't been associated with the hiring.

Another conflict aroused with the new employees who claimed the same advantages than the contractual employees previously hired by the Tripoli water office. The stake of the conflict was the fear that the private management would result in a less protected status (Yousfi 2006). Another problem was the end of the water rights held by some categories of Tripoli inhabitants and by local institutions. Historically, some families and institutions owned shares of the main source of water that supplied the city. The reform of the water sector has suppressed these inherited rights (Rajab 2006). The Tripoli project was not directly the cause of the change but ONDEO-Liban had to collect the bills from the ancient right-holders. This was angrily contested by the Great Mosque in the ancient city, which used to supply water to its neighbourhood for free. The imam called water a gift of God and refused to pay<sup>9</sup>.

All these conflicts illustrated the resistance of the local society to the changes the private management was introducing or was associated with. They highlighted that water delivery and water management are a main source of power in the city. The privatisation process is threatening it. Notwithstanding, several compromises were reached and things are moving forwards.

Despite the improvements stated in Tripoli, ONDEO-Liban has decided to step down, claiming the difficulty it faced while operating in Lebanon, at a critical time of political instability, and complaining about the difficult relationships with a bureaucratic administration. Such a decision is also in line with the global strategy of the firm, which has ended several other contracts since 2002 (the most famous of them is Buenos Aires), because of the low profitability of operation in poor countries.

Whatever the responsibility in the Tripoli case, the fact is worrying. Indeed, the experience was expected to be extended to all the Northern province, assuming that the operation at the scale of the city would be highly profitable and that a balancing out with less attractive rural or mountainous regions could be implemented. One can fear that few foreign investors will be interested in investing in Lebanon, as the international community had planned. The issue of the modernisation of the water sector remains without any easy solution, particularly for poor areas. The relative improvement in Tripoli will not benefit to nearby poorer places, thus aggravating the prevailing spatial inequalities.

### ***Subcontracting the power distribution: uncovering the peculiarities of local regulations***

The process of privatising the power sector only stands at its very beginning. The Saniura government commissioned several auditing firms and consultants in order to lay down the way to the corporatisation of the utility, which implies a cost accounting and the census of its assets. Then, it's planned to unbundle it into several functional units (generation, transportation and distribution), of which the first and the last would be sold or whose operation would be managed by private firms. Before reaching this stage, it is possible for a

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<sup>9</sup> According to interviews with AFD officers, Paris, 14 th December 2007.

management contract to be established in order to upgrade the utility's results. Some critical reforms must be carried out, like the setting up of a new tariff reflecting the rise in the generation cost resulting from the oil price surge. The tariff has not been updated since 1994. In 2007, the Lebanese government has awarded two projects of power generation plants but they seem to be shelved. No project has been drafted for the distribution sector yet, though PPP are frequently said to be the solution<sup>10</sup>. Nevertheless, between 2002 and 2005, an interesting experience took place, whose results I will analyse now. The government assigned private firms the task of reading the meters, of distributing the bills and collecting the fees, as well as of detecting the fraud and fixing it. In Beirut suburbs (*da'ira* of Antelias and Chiyah), the French firm EDF was commissioned. For the other *da'ira-s* throughout the country, local firms were selected after a tender. Most of the selected ones were without experience in the field and, as I was told, in many cases their owners were known for their closeness to the local *zu'ama-s*. The experience stopped in July 2005 when the contract of EDF was ended without explanations, probably because of the change in the balance of power after the legislative elections and the arrival of a new minister. Later on, the contracts of the private local firms in the *da'iras* were also interrupted or not renewed.

This limited experience of subcontracting private firms reading the meters and fighting the fraud resulted in strongly contrasted results. At one end, EDF scored very impressive results in its period of operation. The amount of billed electricity rose (+50%), the rate of non-payment fell down at less than 4%, EDF made a hike in detected fraud (more than 100.000 thefts detected and fined in 2002-2003)<sup>11</sup>. These achievements were obtained through 'commando methods', according to one manager: it means an intensive monitoring on the field, bimonthly fraud eradication operations, etc. The EDF teams faced strong opposition from fraudulent electricity users, sometimes turning to local riots (March 2004 in Jnah). According to the manager, the operations were successfully implemented with the help of the Interior Security Forces (ISF) and when necessary, thanks to coordination with those labelled "villages chiefs" by the manager. In Dahiyeh, he also mentioned close cooperation with Hezbollah. EDF targeted not only 'small fry' but also personalities, major enterprises, in the southern suburbs as well as in the northern suburbs. Their methods and results were so successful that EDL authorities invited EDF teams for one-day commando operations in Saida, Jounieh and Tripoli. The EDF enrolment was dedicated to impulse new methods and a new spirit to the employees of EDL regarding the distribution. The contract apparently didn't provide for a link between EDF's income and its results. It is possible that EDF was seeking to be granted a broader contract on the Lebanese market but its presence was part of a wider strategic help and technical program for the rehabilitation of EDL. In 2005, the collaboration in the distribution ended, probably because EDF worked on the field with associated firms that were linked to Syrian interests.

In most Lebanese provinces, the private local firms in charge of reading the meter and collecting the fees didn't reach the same results. No figures were available from EDL, one reason being that EDL experienced many difficulties in monitoring the results these private firms achieved. According to non official sources embedded in the operations in the North and in the Biqaa, the results have been very disappointing both in terms of fees collecting and of fraud detection<sup>12</sup>. Among the many reasons of the deceiving operation, we can name the lack of professionalism of those firms, the flaws in the mechanism of linking their earnings

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<sup>10</sup> For instance, *Le Commerce du Levant*, septembre 2008 ; or Dana Halawi , 'Diversity key to managing fuel price swings', *The Daily Star*, March 26, 2009

<sup>11</sup> S. Risk, « Énergie - Une récapitulation de ce qui ne tourne pas rond depuis des années. L'électricité, un secteur gangrené de toutes parts », *L'Orient-Le Jour*, 28/12/2004.

<sup>12</sup> A sounder analyse is available in Verdeil 2009.

with their results, the protection that the cheating or non-paying customers enjoyed from their *zu'ama*, as well as the lack of coordination with the ISF.

The experience of subcontracted private firms in order to read the meters, to collect the fees and to fight the theft delivers no black or white results. It shows that the private sector isn't in itself the criterion of a successful reform: it depends very much on the political regulations on the field and the keenness of local forces to comply with the enforcement of new practices. In the period until 2006, it seems that Hezbollah favoured reform even at the expense of most of its clientele in Dahiyeh. Conversely, in other areas (Biqaa, North Lebanon, South), local forces have been reluctant to the reform of the distribution sector. Therefore, we can conclude that those experiments have aggravated the territorial fragmentation, since the implementation of that new management methods results being particularly felt by the inhabitants of the Greater Beirut. In that area, the better fees collections and the reducing of theft has led to an increase in spending, relatively more difficult to bear for the poorest households.

## The recent wars and the politics of infrastructure

The political violence of the three last years has had strong impacts on the electricity and fresh water infrastructure, thus affecting the performance of the utilities. The aggravation of the already tensed conditions of supply makes it compulsory for the households to rely on alternative means of provision. But once again, the geographically and socially differentiated weight of these alternatives can be read as a new factor of fragmentation.

### ***Infrastructures as targets***

Stephen Graham has theorised, in an analysis based on the American policy vis à vis Iraq, “the changing nature of war” and the targeting of “the vulnerabilities of urban metabolism” in order to “forced demodernization”. He stresses that “war and geopolitical struggle are increasingly being fought through the infrastructures of everydaylife” (Graham, 2005, pp.246-248).

The case of Lebanon sustains such a view. The war of summer 2006 provides a first account. The Israeli chief commander openly pledged to take Lebanon twenty years backwards. Under the pretense of cutting all communication lines for Hezbollah, the Lebanese infrastructure in has been systematically targeted and hugely damaged. The power and water sectors have been prime targets during the Israeli war of the summer 2006, at least in the South of the country. The IDF have bombed the power plant of Jiyeh and several poles and substations in the south. In the same time, they also targeted various water stations and pipes. As a result, most southern cities and villages remained without power and water for long weeks. The cost of the damages inflicted to water and electricity infrastructures has been estimated to 193 M\$<sup>13</sup>. Syria then offered to increase its power delivery in a sign of solidarity with the Lebanese people. Given the tensed relationships between the two countries after 2005, this gesture highlights the geopolitical nature of electricity.

Another interesting example shows that internal conflicts also might take infrastructures as targets. At the summer 2007, during the siege of Fatah al-Islam in the Nahr al Bared camp by the Lebanese Army, the Islamist fighters targeted successfully the Deir al Ammar power plant, thus reducing again the generation potential of EDL. In both cases, the attacks against the water and power networks were not directed against the cities or specific places, but

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<sup>13</sup> [www.rebuildlebanon.gov.lb](http://www.rebuildlebanon.gov.lb) (21/12/2006).

targeted the country as a whole integrated and interconnected network. In the villages and small towns of the South, the addition of the damages to the various networks combined with the overall destructions led to a long-lasting paralysis.

### ***The socio-territorial impacts of the infrastructure targeting***

Graham's analysis stresses that the US strategy regarding networks was intended to weaken "to disable Iraq's war machine and influence civilian morale", while it "led, indirectly, to mass civilian casualties, as Iraqi urban civil society was ruthlessly demodernized" (Graham, 2006, p.253). The magnitude of the damages resulting from the 2006 summer war in Lebanon, and from the siege of Nahr al Bared cannot be compared with Iraq. But they have had long-lasting and systemic effects. They thus offer an opportunity to develop Graham argument, in showing how such damages to the networks emphasize and increase the fragmentation process already at work in the Lebanese society. The case of electricity is particularly demonstrative<sup>14</sup>.

Since the 2006 summer war, the damage of the electricity grid and the diminished capacity of power production have led to an increase of the shortage at the national scale. It must be said that at the same time, the surge of oil prices has aggravated the financial situation of EDL and limited its capacity to intervene. But once again, the spatial distribution of the shortage was not homogeneous and some places suffered more than others. Data provided at the beginning of the year 2008 (table 2) show the deepening of the situation regarding power distribution between the regions and the capital city. What's more, this was happening while the surge in oil price made the supply of electricity from generators far more expensive, and in the context of increasing prices and deep economic crisis. We have previously shown that the burden incurred because of the recourse to generators is proportionally heavier for poorer people. So, the consequences of the power infrastructure crisis accentuate the already existing fragmentation process.

This is palpable through the emergence several social movements that can be analysed as a reaction to that crisis. During December 2007-January 2008, several demonstrations against the electricity crisis took on the street. They eventually degenerated on the 28<sup>th</sup> of January in a bloody riot in Chiyah, which left several dead casualties. This must certainly be interpreted as a step in the mounting tensions in the fight between the Hezbollah-led opposition and the Saniura government, which peaked in the May events. Without contesting the political signification of the movement and its political uses, its social roots must be clearly understood. Indeed, the people of Dahiyeh have not only suffered a very strong rationing of the electricity delivery (like do all the Lebanese outside Beirut). They have also paid the higher price of the implementation of the reform of the electricity distribution. The riots of end 2007-2008 in Dahiyeh can therefore also be understood as a paradoxical result of the failed reform of theft repression and billing examined above. After the end of those contracts in 2005 and after the 2006 war, all reports mention lower collection rates and rising frauds practices, in relationships with the splitting politics on the fields, and probably, with the deteriorating economic situation<sup>15</sup>. The inhabitants of Dahiyeh are among the ones who have paid the higher price during EDF intervention; today, they have to bear, like all the Lebanese, the continued interrupted delivery of electricity, and have to consume more diesel for the generators at a time when the price of diesel has frantically grown.

## **Conclusion**

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<sup>14</sup> We believe our hypothesis could also be verified in the Iraqi case (see Verdeil 2008).

<sup>15</sup> See for instance : *The Daily Star*, 30 June 2007.

Understanding, beyond its technical dimension, the social and political stakes of the management of urban infrastructure is an interesting avenue into urban research in Lebanon. The multiples failures in the urban services delivery in the Lebanese cities make their investigation a critical field in order to depict the social, political and sectarian fragmentation at work.

During the reconstruction years, (urban) infrastructure has enjoyed huge investments. But little attention has been given to the management of the service supply, which remained hostage of the *zu'ama* controlled redistribution of services and therefore contributed to the enormous increase of the public debt, while the performance remained questionable. The invisible flows of water or electricity are critical components of the daily life and their delivery is the result of complex technical social and political negotiations, including negotiations of space, between political forces at the national and the local level, the inhabitants and public or private (sometimes informal) operators.

The recent attempts to reform these sectors have experienced huge difficulties and proven deceiving. With reference to Graham and Marvin's thesis, one has to acknowledge the fact that the design and implementation of public private partnerships has, until now, remained very limited. Turning to privatization hasn't been a decisive step and has engendered mitigated results. The reform of urban service does not only depend upon the impulses for reform that are sent from the top (government and international institutions). Given the particular nature of the political field, and its fragmentation, the implementation of reforms is highly dependent upon the involvement of locally rooted social and political forces. These experiments have complexified the patterns of governance but, though trends of accentuated fragmentation can be stated, we cannot generalize and maintain that the neoliberal reforms of the water and electricity sectors have increased the social and spatial fragmentation in the country.

The recent wars and the targeting of infrastructure have produced long-lasting effects that have grown over a messy situation. The damages have nurtured and increased social, geographical and sectarian tensions already at work. The politics of infrastructure or of the "urban metabolism" prove highly sensitive for the equilibrium of the Lebanese society. There are of course technical decisions that have to be well weighted in order to improve the production of power, and to extend and upgrade the networks of water and electricity in order to make the delivery more efficient, thus allowing the customers to cut the cost of alternative supply. It is also needed to recover the cost incurred through adequate and socially fine-tuned rises in tariff. The challenge is to achieve these objectives without aggravating the fragmentation process. Therefore the political dimension of such decision has to be clearly acknowledged. It is time to find a way towards social and spatial justice.

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