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Éric Verdeil

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Securitisation of urban electricity supply

A political ecology perspective on the cases of Jordan and Lebanon

Eric Verdeil

Abstract: *Questions about urban infrastructure, resilience, and violence are central to current urban general literature since infrastructures function as locations of conflict and negotiation over the public good, inclusion and exclusion, and mobility in the city. This chapter develops a theoretical framework to analyse the emergence of new concerns for urban energy security in the cities of Amman (Jordan) and Jbeil and Zahleh (Lebanon). Supplying these cities with electricity requires creating new circuits that are both material and sociopolitical. In Amman, one of the projects proposed for coping with the projected growth of energy demand was to build a nuclear plant in the "desert" close to Amman. This project, now allegedly in the final studies stage, has experienced many episodes and delays. Analysis shows the pressure of urban energy demand and the resizing of metabolic circuits at the level of the metropolis of Amman, while the governance of these circuits remains state-driven despite popular protests. In Jbeil and Zahleh, in the face of regular and long-lasting power cuts, local capitalist actors have taken the lead to provide an alternative electricity supply that replaces both the national grid and informal generators that are in use elsewhere in the country. At first glance, both situations seem very different in scale and in the type of actors involved. But in both cases, these new circuits are heavily contested and redistribute agencies of power in ways that empower some actors but that, at the same time, erode solidarity at the city and the national levels.*

Middle Eastern cities, like many cities on comparable development paths, are currently experiencing problems with supplying energy, specifically with supplying electricity. This is best illustrated by the power cuts that many such cities undergo, whether they are regular and planned, as in Lebanon or Iraq, or unpredictable, such as the sudden blackout in Tunis on 1 September 2014. In response to this situation, cities – and citizens – have developed a broad range of coping strategies to alleviate the resulting difficulties. Demographic growth and new energy consumption patterns are exacerbating what is experienced

and described on the ground as an energy crisis. As a consequence, the security of urban electricity supplies has become a new mantra.

This focus on urban energy problems represents a turnaround from the priority once given to rural electrification and the objective of nationwide access to electricity. While these efforts continue, a new imagination of energy threats has prompted a shift in geographical priorities and the introduction of policies designed to securitise energy supplies. What this essentially means is the resurgence of the state in the realm of energy policy, after decades of liberalisation and market rhetoric (Bridge, 2015). This policy turn reflects the emergence of new pressures, including fears concerning peak oil, increases in global energy prices, and threats to transport infrastructures. These threats can be ecological (e.g., Hurricane Katrina, which disrupted vital energy infrastructures supplying US cities) or geopolitical, with the deliberate targeting of energy routes, as has happened in relations between Russia and Ukraine or in recent Middle Eastern conflicts (Iraq, Syria, Egypt, and Israel). Despite the recent popularity of energy security in policy circles, scholars criticise the notion as lacking precision. It can indeed cover many different ideas and vary widely in scope. From a geographical perspective, it is usually applied to relations between states and hence obfuscates or conceals other possible spatial relations, such as those between cities and areas inside or outside their national borders (Bridge, 2015).

This chapter explores this complex but neglected geography of energy policies (Bridge et al., 2013; Pasqualetti and Brown, 2014; Sovacool, 2014). It argues that concerns about urban energy security are moving into the political agendas of both national and local governments, a trend that in the case of global cities has begun to receive scholarly attention. Hodson and Marvin have shown how the notion of urban ecological security can provide insight into the unfolding of a diverse range of policies and commitments in a number of global cities, such as London or San Francisco. These policies reflect concerns over energy security – linked with the protection of vital infrastructures and with new capitalist development strategies – shared by coalitions of metropolitan elites that encompass municipal authorities and multinational companies based in such cities (Hodson and Marvin, 2010). This is taking place at a time when certain global cities are increasingly autonomous vis-à-vis states.

The situation of Middle Eastern cities is starkly different from that of these so-called global cities, providing an opportunity for research into two sets of factors that merit a more critical approach than is apparent in the dominant conversation. This chapter makes the twofold argument that the emergence of energy security concerns at the level of cities (1) is not driven by the transition

to low carbon energies and (2) raises and unpacks sharply contrasting political claims about the future of cities and nations.

A widely accepted understanding of urban energy transition sees it as a commitment to reducing greenhouse gas emissions and developing low carbon technologies, in the belief that urban energy consumption is a major contributor to reducing the unwanted effects of climate change (Bulkeley et al., 2010). However, this approach is too normative and can be misleading (Rutherford and Coutard, 2014), especially as applied to cities in emerging economies (Jaglin and Verdeil, 2017). It tends to mask other factors that drive energy policies at the urban level, including ecological concerns for the local environment and economic motives. Because of these local conditions, policy choices may not prioritise low carbon solutions but instead focus on (sometimes large) thermal generation technologies, as in the cases examined in this chapter. The argument here is that in most Middle Eastern cities, low carbon transition strategies are not priorities for national and local governments in their efforts to tackle energy challenges, specifically energy security.

Another key point highlighted by Middle Eastern cities is the increasing level of politicisation around energy issues. In most cities in the region, local authorities remain under the tight control of state authorities (United Cities and Local Governments, 2008), a legacy of colonial centralisation and of authoritarian rule. In the Middle East, energy remains the domain of national sovereignty par excellence. However, in the aftermath of the Arab Spring, it has become a powerful issue at the urban level, prompting citizen mobilisation (Lakhal, 2014; Verdeil, 2014c). Street protests have occurred in opposition to tariff increases or in support of a right to light, in contexts where frequent power cuts disrupt urban living patterns that have become dependent on modern technologies. These claims (which are not typical to the region (Luque-Ayala and Silver, 2016)) are to be understood in a context where neo-liberal policies have eroded the social contract that had linked states and citizens over years of development strategies. The promise of (rather than real access to) infrastructure – the so-called modern infrastructural ideal – was central to this political trade-off (Chanson-Jabeur et al., 2001; Graham and Marvin, 2001).

In sum, the objective of this chapter is to identify and characterise urban energy security strategies in Middle Eastern cities by highlighting two facets – one pertaining to governance, political economy, and politics and the other focusing on the material and technical choices made – and to connect them to political issues, in an approach inspired by urban political ecology. The analysis will draw on two case studies that help to unpack the diverse

configurations of urban energy security and the different levels of importance in the already-mentioned factors.

An Urban Political Ecology Framework to Understand Energy Securitization

There are numerous definitions of the notion of energy security and a multiplicity of energy securitisation policies. The analytical lens provided by urban political ecology helps to frame them in a productive way for the purpose of this chapter. Sovacool (2013) has identified around forty-five different ways to define energy security, sometimes mutually contradictory or misleading. For instance, the International Energy Agency defines energy security as "the uninterrupted availability of energy sources at an affordable price" (IEA, (n.d.). This definition combines an infrastructural and an economic dimension and emphasises distribution. However, the nature of energy insecurity is greatly affected by the materiality of the energy source. In the case of oil – and excluding black swan events – energy security is essentially about the variation of prices on international markets, whereas "The concern for physical unavailability of supply is more prevalent in energy markets where transmission systems must be kept in constant balance, such as electricity and, to some extent, natural gas" (ibid.). This unavailability is related either to net-import dependence or to the "political stability of suppliers". Energy security as defined by the International Energy Agency (IEA) appears to be multifaceted but is highly contingent on specific energy forms and on specific institutional and geopolitical contexts, but the IEA definition tends to overlook the links between these facets. For instance, disruption of natural gas imports (through either interruption or price hikes) drastically alters the way electricity is generated and its affordability. The definition also tends to limit the its relevance to the realm of international – and more precisely, interstate – relations. However, as Gavin Bridge has noted, the increasing number of policies that incorporate energy security "not only change the objects and subjects of securitisation but also introduce alternative territorialities to those of the state while also problematising relations among different organisational scales" (Bridge, 2015).

In contrast to definitions of this kind, this chapter adopts an urban political ecology approach that acknowledges how energy (in)security arises along the chain linking energy forms at their different stages: extraction, transport, conversion, transport (again), and consumption. Urban political ecology focuses on the circulation of natural flows through space as they merge with flows of capital and power, in order to understand how the city is produced: the "enabling and disabling social and environmental conditions" of the city (Heynen, Kaika and Swyngedouw, 2006; Swyngedouw, 2006; Monstadt, 2009:

10). Thus, as Timothy Mitchell suggests, understanding energy (in)security entails the need to "follow closely a set of connections that were engineered . . . between carbon fuels and certain kinds of democratic and undemocratic politics" (Mitchell, 2011: 252–253). In addition to this political ecology perspective, Mitchell's specific insight is to highlight the vulnerability of these circuits, specifically at the spatial connections that allow them to work. Since this vulnerability – and hence (in)security – is politically produced, Mitchell is able to identify strategies of securitisation/disruption around these vulnerable spatial connections. Securitising energy circulation involves the building of territorially based alliances, making it necessary to examine the political and social exchanges that fuel these alliances, such as patronage relationships.

Another contribution of urban political ecology is its relational understanding of the city. Instead of a "bounded and scaled" space, the city is best understood as a node (or a complex of nodes) interweaving various flows and power relations that run across scales and political boundaries (Swyngedouw, 2006). Because research on energy security needs to make sense of "alternative geographies" (Bridge, 2015) to the state, this relational approach allows us to consider the cross-level negotiations and coproduction of security policies by the state and, this chapter contends, by metropolitan authorities and economic elites.

With these two principles in mind, the empirical analysis can be framed by looking at a number of publications that have begun to trace the issues and policies pertaining to urban energy security. The paradigm of "urban ecological security", as identified by Hodson and Marvin (2009; 2010), points to the emergence of "strategies to reconfigure cities and their infrastructures in ways that help to secure their ecological and material reproduction" (Hodson and Marvin, 2009: 194). For the authors, the emergence of these strategies is linked to two related processes. The first is the increasing "ecological pressures" that cities face and that are disrupting vital sectors of the economy, including energy. The second is the growing autonomy of global cities vis-à-vis the state in a neo-liberal economy, with increased economic competition between cities in a context of neo-liberal policy shifts that empower major metropolises (cf. also: Brenner, 2004). The coalition of interests that speaks on behalf of cities – that is, metropolitan authorities, business representatives, and NGOs – not only values the "continued connection of intra and interurban infrastructure" to protect the economy but also seeks to take advantage of the "eco-competitive race" that is "[r]ecasting . . . the neoliberal competition" (Hodson and Marvin, 2010: 98).

Hodson and Marvin identified a series of policies within which these strategies are implemented. Particularly relevant to our argument is the "decoupling from

national infrastructure and circuits and the downsizing of circuits" (Hodson and Marvin, 2010: 105). Decoupling from national infrastructure provides a safeguard from remote events that could potentially threaten natural resources supply to cities – for instance, the disruption of energy circuits. To alleviate such threats, major energy circuits are strategically relocated through the diversification of energy supplies to sources that are potentially less vulnerable or that are locally available and that can be harnessed by new technologies. These are typically low-carbon and renewable energy solutions. In addition (or as a corollary) to this, another response is the downsizing of circuits. The construction of shorter, closed loops and the quest for autonomy or even autarchy in various ecological resources are part of this framework for making cities more resilient to sudden changes affecting the supply of resources.

The body of research spearheaded by Coutard and Rutherford around the issue of post-networked cities also offers interesting insights for framing the problem of securing resource flows (Coutard and Rutherford, 2016). Specifically, they direct attention to the articulation of the new geometries (autarchy vs autonomy) arising from the reconfiguration of circuits (closing loops, rebundling) on regional and urban scales and to the governance of these infrastructures (on a continuum from individual to collective decision-making) (Coutard and Rutherford, 2010). Interestingly, while autonomy or autarchy can protect cities from disruptive events, disconnection from larger networks can under certain circumstances conversely expose a city or collective to local infrastructure disruption without backup from the larger network. Autarchy signals the end of the solidarity once promised by the modern infrastructural ideal.

To what extent are these topics of investigation relevant to the energy security of Middle Eastern cities, where the political, economic, and infrastructural parameters that condition energy choices and usage differ greatly from those of the global or European cities on which these authors focus? Our case studies feature cities characterised both by strong state dominance in urban governance (hence little local political autonomy) and by smaller involvement in the world economy, making capitalist firms less likely to use them as laboratories of a new, green capitalism. The question here is whether ordinary cities face similar energy challenges and, if so, how they tackle them.

Table 17.1 summarises the variables that the analysis will consider in the light of these questions. Two main points are scrutinised: (1) the geographical and infrastructural reconfigurations of energy circuits, with a focus on the variables of scale, energy mix diversity, and geographical import diversification and (2) the governance of these circuits, within which the variables are the actors and organisations involved (public vs private, state or local authorities vs

international organisations, inhabitants vs decision makers) and their interrelations (political resources and the nature of political exchange, such as negotiations and hierarchical decisions).

Table 17.1 Issues examined and analytical variables

Issue examined	Variables under scrutiny
Reconfiguration of energy circuits	Scale (from regional to local) Diversification of energy technology and forms Diversification of energy routes
Governance and the politics of energy circuit reconfiguration	Actors and organisations involved (public/private, state/local/international, inhabitants/activist groups/decision makers) Type of political relations (negotiation, conflict, hierarchical decisions)

In what follows, I examine the case of Amman in Jordan – more specifically the plan for the construction of a nuclear power plant near Amman – and the Lebanese cities of Zahleh and Jbeil, where the private firms in charge of electricity distribution are attempting to extend their activities to power generation and to craft energy autonomy while withdrawing from the disrupted national electricity grid, which has never fully recovered from the civil war. This chapter draws on information gathered over more than ten years of research on the transformation of the electricity sector in Lebanon. I personally carried out numerous interviews involving a variety of stakeholders (public and private utilities, the Ministry of Energy in Jordan, consultants, NGOs, and inhabitants), supervised several masters students, and carried out a regular press review (see also Verdeil, 2009; 2016). In the specific case of Amman, I have undertaken four field visits in the last six years, the most recent in October 2014, during which I was able to interview several activists (local and national) opposing the construction of the nuclear power plant. I conducted other interviews with representatives of government and public and private utilities and extensively consulted official and press documents gathered on-site and online (Verdeil, 2014b).

Amman (Jordan): towards a new urban ecology?

The vigorous demographic and economic development of Jordan's capital city, Amman, is triggering fast-growing demand for energy, specifically electricity (Mason, Al-Muhtaseb and Al-Widyan, 2009; Verdeil, 2014b; Ahmad, 2015). The country heavily depends (96 to 98 percent) on hydrocarbon imports from its neighbours, oil from Iraq until 2003, and natural gas from Egypt for electricity generation since 2002. Since 2011, however, the Jordanian authorities have

experienced a drop in the reliability of natural gas imports because of repeated bomb attacks by Islamist fighters on the pipeline carrying fuel from Egypt through the Sinai. This sudden disruption has forced them to buy heavy fuel on the international market at a time of booming prices. While this fix alleviated interruptions in the electric supply, it placed a heavy financial burden on the national utility NEPCO (National Electric Power Company) , which was not able to pass on the increased cost to customers. In the wave of revolt associated with the Arab Spring in neighbouring countries, the government was wary of any price increases that might fuel anger in the streets. It is only since 2013 that it has increased electricity tariffs, and even then for big customers only (Verdeil, 2014c).

In a situation of energy crisis, the Jordanian authorities are therefore pursuing a strategy of energy diversification and geographical relocation (Hashemite Kingdom of Jordan, Ministry of Energy, 2007). This includes the exploitation of oil shale for electricity generation (with a target of 14 percent of primary energy by 2020), the development of wind farms and solar power (10 percent by 2020), and new contracts for importing natural gas, either through a liquefied natural gas (LNG) terminal in Aqaba (imports from Qatar), through the construction of a new pipeline from Iraq, currently being commissioned or, as of 2014, through deliveries from Israel, a practice that is sharply contested. It also includes the project to build a nuclear power plant, under study since 2007, which was intended to supply 6 percent of primary energy by 2020.1 The purpose of this strategy is to reduce exposure to the impact of regional geopolitics on energy imports by locating electricity production within the country at an affordable cost. The following section of the chapter analyses the nuclear project in the light of the variables identified.

The nuclear project in relation to Amman's urban ecology

Despite the fact that the Ministry of Energy planned the nuclear project in Jordan within the framework of a national energy strategy, the arguments put forward to justify the changes in the project highlight its special connection with the urban ecology of Amman and its region, from Madaba in the south to Zarqa in the north and to Salt in the west. First, it can be argued that the issue of Jordan's energy security is above all about Amman's energy security. Altogether, in 2011 – before the large-scale influx of Syrian refugees – the capital conurbation accounted for just under 50 percent of the population, with roughly three million inhabitants (Ababsa, 2013), while 70 percent of industry workers and 67 percent of skilled workers were in this area in 2006. Electricity consumption in the area covered by Jordanian Electric Power Company (JEPCO), the utility that holds the concession for the region, represents 61 percent of national consumption. The geographical concentration of the

population and the economy in the capital city region explains the high demand for electricity.

The nuclear power plant was initially to be located in Aqaba, in the south of the country, a place with access to the sea and therefore to the water needed to cool the reactors. In 2010, however, this initial site was abandoned. Several technical arguments were raised, such as the high cost of pumping seawater to the site (Ahmad, 2015) and the seismic risk, since Aqaba is located on a large earthquake fault. In addition, press reports also hinted that the countries neighbouring the Aqaba site, in particular Israel, had put pressure on the Jordanian government for fear that an accident to the plant might affect their territories (for a more detailed discussion of these arguments, see Verdeil, 2014b).

The Jordan nuclear authority then picked a new site, near the city of Balama, in the northern region of Mafraq, about 35 kilometres from Amman (Figure 17.1). The proximity of the power plant to the central urban conurbation was a strong economic argument for the project, since it cut out the cost of reinforcing the high voltage line from Aqaba to Amman, a distance of about 400 kilometres (Figure 17.2). Even the issue of cooling for the plant, in principle a big problem in the world's fourth driest country, has been turned into a plus. Inspired by the example of the Palo Alto nuclear power plant in the United States, the Jordanian Atomic Energy Commission plans to use Amman's wastewater, treated at the Khirbet el-Samra plant in the north-east of the conurbation, to cool the reactors.

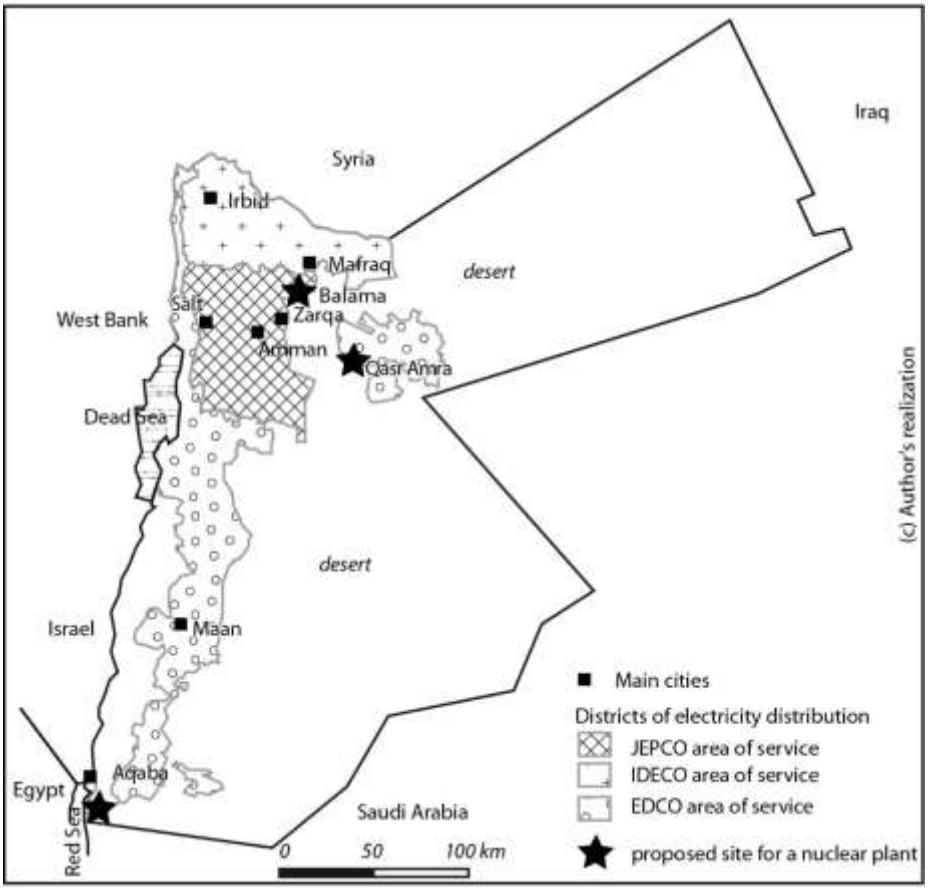

Figure 17.1 Geography of the nuclear project near Amman.

Figure 17.2 The high-voltage electricity line in the desert between Amman and Aqaba. Building a nuclear power plant near the sea would have implied the doubling of this line over some 400 kilometres, a huge investment.

Author, 2010

The geographical and material arguments advanced by the government and the nuclear commission to justify the nuclear plant project near Amman are not confined to fixing Jordan's dependency on other countries in the light of the turbulent geopolitical environment, though this is obviously a strong motivation, as evidenced by the other strands of the diversification strategy. At a minimum, the relocation is rooted in the idea of decoupling Jordan's energy supply from regional circuits. The project's location also appears to be part of a strategy that favours not only urban proximity and hence the "downsizing" of the energy circuits but also a sort of metabolic rebundling through the use of the city's grey water. The strategy therefore shows unexpected similarities with the policies of "post-networked cities" that are being implemented in green

cities, which usually don't take nuclear energy into consideration (Coutard and Rutherford, 2010).

Indeed, the project has sparked technical and financial controversy among experts and international agencies. In March 2012, after a competitive bidding process, the government announced that it had chosen the Russian firm Rosatom to develop the project. The Russians offered to develop the power plant as a Build Operate and Own project and committed itself to funding 49.9 percent of an investment estimated at US$10 billion. A first criticism of the project was its economic cost. Several analysts wondered if the Jordanian government would be able to secure the large amount of money required for the investment at a time when the country was running an unprecedented deficit (93 percent of GDP in 2015) (Ahmad, 2015; Gamba, 2015; Magid, 2016). The same question was raised about the Russian firm's capacity to fund such a large investment. More recent sources have mentioned the possible involvement of Chinese investors with a 35 percent stake, which is interpreted as a sign of significant funding problems (World Nuclear Association, 2016). Having made the choice to disentangle itself from the Middle East's complex geopolitics, the Jordanian government has become dependent on a technology that is largely out of its hands in terms of expertise and that entails significant external financial support that might erode its sovereignty in another way.

The second category of arguments against the project is more technical and casts doubt on the possibility of developing such a big nuclear project in such a small country (Ahmad, 2015; for a detailed analysis, see Ramana and Ahmad, 2016). The project entails the construction of two 1060 MW reactors, which would represent about 30 percent of the country's total generating capacity. In the event of planned – or, even worse, unplanned – outages, the stability of the grid might be severely affected. The project's backers claim that Jordan would become a net exporter of electricity to neighbouring countries, but this would entail heavy investment in reinforcing interconnections, which are currently inadequate. Another strategy would have been to build smaller reactors, more appropriate for a small grid. These technical criticisms directly challenge the scale of the project. Whatever the fate of this intriguing nuclear project in Jordan, its existence and the debate on the issue of scale and the reconfiguration of ecological and energy circuits demonstrate that even when renewable energy is not at stake, energy systems may move beyond state territories in their scale and geographical organisation.

Local politics versus centralised governance

Though the project is directly linked with the ecology of the Jordanian capital, its governance remains fairly centralised. Not only are the municipal

authorities out of the loop, but local protest movements against the project have been circumscribed by central state institutions.

Once the population of Balama, located between the Khirbet el Samra water treatment plant and the city of Mafraq, got wind of the project, a strong popular movement grew, both locally and in the capital, where several demonstrations took place in 2011 and 2012 (Verdeil, 2014b). The place was on the tribal lands of the Bani Hasan, a powerful tribe in Jordan, though its members not only live in the original villages where their ancestors used to herd camels and shee, but have also settled in cities. The protest movement was mostly concerned with issues of safety and accident risk, as well as with the expropriation of some of their tribal pastures. The protest gained momentum on the streets and on social networks, and under the name Irhamuna ("Mercy for us"), it was able to attract support well beyond its constituency, notably from local and international NGOs. In the wake of the Fukushima Daishi accident, Greenpeace drew the attention of the international media by demonstrating, disguised as nuclear workers, in front of the Ministry of Energy. Local environmentalist NGOs, wary of being labelled as allies of such international organisations, and therefore not willing to cooperate with them, published op-eds in the press, and lobbied parliamentarians, ministers, and public figures. They soon gained strong backing, with several nuclear scientists, former energy administrators, and even a daughter of the king taking a firm stand against the project.

In March 2012, Parliament voted against the construction of a nuclear power plant in Jordan, but the decision had no binding force. In October 2013, the government and the Jordan Atomic Energy Commission (JAEC) announced the move to a new site: Qasr Amra, 62 kilometres from Amman and about 20 kilometres from the oasis of Azraq, in the desert east of the capital. This more remote region is home to the Bani Sakher tribe, who in turn were quick to mobilise against the project. Despite employing similar strategies, however, they failed to achieve the same results (at the time of writing). This can be explained by the government's capacity to overcome its main and most influential opponents and by its strong commitment to what was deemed a royal project.

From its beginnings in 2007, the nuclear project was directly backed by the king as a national priority. In 2010, he reacted to discreet pressure to move the project from Aqaba by strongly reasserting the country's right to develop a civil nuclear programme. The Jordanian government created two new bodies dedicated to the project, JAEC – in charge of commissioning studies – and the Jordan Nuclear Regulatory Commission, which having later merged into the Jordan Energy and Minerals Regulatory Commission, was responsible for

regulating the sector. The nuclear projects also include a small experimental reactor, currently under construction at the Jordan University of Sciences and Technology, and training for technicians and engineers through international cooperation agreements with more than ten nuclear countries. This strong commitment to nuclear energy explains how the government dealt with the popular protests and the distinct fates of the two protest movements.

The protest in Balama occurred at a tough time for the government. Between 2011 and 2012, the king fired three prime ministers in a climate of widespread protest against rising living costs, energy prices, and corruption among members of the political and business elites. At times, the king himself was targeted (Abu-Rish, 2014). The political context helps to explain the government's strategy to defuse the tension around the nuclear project and to prevent it snowballing into other protests. In addition to this, the president of Parliament, himself a member of the Bani Hassan tribe, is said to have spoken personally to the king to urge a change of location.2 Trade-offs at the highest level of the state thus explain the relocation of the project.

Conversely, in Qasr Amra, despite edgy demonstrations and political outrage in Parliament led by Member of Parliament Hind al Fayez, herself from the Bani Sakher tribe and a representative of the Azraq region, the movement lost momentum. Several political representatives once prominent in the protest movement were, according to Hind el Fayez, persuaded to change their minds after being granted personal advantages for themselves and their families, such as jobs in Parliament and the public administration. The tactics thus adopted to disempower the local protest movements reveal a high level of centralisation in decision-making. They show how a material and technological organisation that seeks to reconfigure energy and ecological circuits at the city level is governed by centralised mechanisms that leave little space for local deliberation.

Zahleh and Jbeil (Lebanon): securing electricity supplies by withdrawing from the national grid?

Since the civil war, Lebanon has never overcome the profound disruption in its electricity supply. Despite improvements during the reconstruction period from 1991 to 2006, load sheddings continued at a minimum rate of three hours a day. Following the Israeli-Hizbollah war of 2006, the situation deteriorated as a result of bomb damage to infrastructures, combined with a lack of investment in maintenance and in the expansion of the grid and of generating capacity, attributable to major disagreements between political groups, specifically over the issue of reform in the electricity sector (Khodr and Uherova Hasbani, 2013). Privatisation projects and other institutional reorganisations of the national

utility Electricité du Liban (EDL) stalled in the face of persistent practices of employment patronage and non-payment of bills, together with hookups and other forms of illegal access to power (Verdeil, 2009; Mandarino, 2016). In addition, geopolitics have also played a part: while the new capacity developed in the late 1990s was designed for natural gas, a cheaper energy source, the pipeline from Syria, was not completed until 2009.

However, the long-awaited supply of natural gas from Syria or from Egypt via the Arab gas pipeline was also disrupted by revolt in Egypt, by the bombing of the pipeline in the Sinai, and by internal war in Syria. Prospects of gas drilling in the Mediterranean, which could become a game changer, have so far been delayed by the lack of consensus between the political elites (Leenders, 2016). As a result, load shedding has dramatically increased. While the capital comes off relatively lightly, with only three hours of power cuts a day, other places experience outages of twelve or fourteen hours. However, in Lebanon even more than in Jordan, electricity is just as central to urban life (light, fridges, TVs, high-rises with lifts, air conditioning, and Internet) as it is in many other middle-income countries.

Faced with the unreliability of the main network, the Lebanese have developed in the last thirty years or so backup solutions, notably small private generators. Over time, this alternative grid has pervaded Lebanese cities, covering them with a secondary power grid that is deeply embedded in the spaces and practices of everyday life (Gabillet, 2010; Verdeil, 2016). It is estimated that 70 percent of households rely on this fix (LCEC, 2014), even though it is an expensive solution (World Bank, 2009). Commercial subscriptions to generators are illegal, since they break EDL's monopoly. However, in practice, they are tolerated and even regulated by municipalities, which own the poles used by the private grids and which , as the body accountable for health issues, may also control the location of the noisy and polluting devices. Lebanon's Ministry of Energy even began to publish a monthly price index so that municipalities could monitor the prices charged by generator owners (Gabillet, 2010), a response by the public authorities to citizens' demand for protection. However, this is not so much a securitisation of the power supply as a fragile attempt to regulate a service whose implementation remains in the hands of private actors. On the other hand, the cases of Jbeil and Zahleh differ from the situation prevalent in other Lebanese localities.

Zahleh, the main city of the Beqaa region, and fifteen neighbouring municipalities, together have a population of around 250 thousand. Jbeil, also known as Byblos, is a tourist and service town on the northern edge of the metropolis of Beirut, with around forty thousand inhabitants. In both cities,

private companies are in charge of electricity distribution (Electricity of Zahleh, and Electricity of Jbeil – usually called by their French acronym EDZ and EDJ, or in Arabic, Kahraba Zahleh and Kahraba Jbeil). This situation dates back to the French mandate, which awarded concessions to private entrepreneurs. While the concessions in other parts of the country have gradually reverted to the state, the families running these businesses have managed to keep their licences. In the last twenty years, they have even modernised the service and now claim the right to generate their own electricity to fulfil a need that the state is no longer able to meet.

Material disentanglement from larger networks

In the Lebanese context, what is distinctive in the struggle of the two electricity utilities is not only their attempt to withdraw from the national electricity grid and its daily load shedding but also their desire to eradicate the small neighbourhood and building-level self-generation and distribution initiatives and thus to establish a new geometry to achieve autonomy, if not autarchy.

Currently, both EDJ and EDZ distribute the power supplied by EDL to their subscribers for about half the day. In their view, there is no hope of improvement: "EDL is not capable of ensuring 24 h year round supply to EDZ. . . . EDL has proven its inability to cope with a growing demand" (EDZ summary, 2016). Dependency on the national grid has become a threat to the future of the cities. But reliance on generators was also deceptive, because the service they offered was expensive and unhealthy and caused damage to the network without commercial accountability. Until 2005 and 2015 respectively, customers had no alternative for the remaining time other than to subscribe to a private provider or invest in their own generator, as everywhere in Lebanon. In 2005, however, the newly elected mayor of Jbeil cited the chaotic and dangerous private web of entangled wires overrunning the streets as the reason for a new initiative. He prohibited the existing providers from using the poles and invited EDJ to replace them with a more professional network of cables and generators. Technically, the two networks remained separate. By 2009, the size and quality of the backup generating infrastructure had improved in comparison with the preexisting situation, but it was still decentralised, with thirty-five units scattered in twenty-seven points across the city's districts (for a detailed account, see Gabillet, 2010) (Figure 17.3). The neutral wires were rebundled into the main grid, showing that the alternative system was not fully self-sufficient. Although the generator grid was officially operated by a separate company, it shared the parent company's workforce and resources, thereby optimising maintenance costs.

Figure 17.3 A fenced generating unit belonging to EDJ, and a pole in the grid managed by the same company.

Photo by Eric Verdeil, 2015

It was not until 2015 that EDZ took a similar initiative. The company had invested heavily in grid modernisation and expansion in the 1990s and the first decade of the 2000s, in response to the region's strong demographic growth. Its performance in the management of bill collection and illegal connections was outstanding,3 but as in Jbeil, increased load shedding reduced the profitability of these investments. In 2015, EDZ made the decision to install its own centralised generation infrastructure: it now rents a set of generation units producing a total output of 65 MW from the British company AGGREKO, a world leader in the kind of temporary power supply used, for example, at the London Olympic Games. After years of argument about the damage inflicted on the grid, the generator owners operating in the area were evicted. In contrast with Jbeil, network operation is centralised, but regardless of the minor differences between the two cases, the result is that both concessions now provide a 24/7 electricity supply through a combination of public grid supply and their own generation, although people still experience the daily shifts from one provider to next.

Both companies have plans to achieve full decentralisation of power production and distribution in their region. In 2015, EDJ joined forces with a number of financial partners to launch a new company, Byblos Advanced Energy, with a plan for building a 60 MW power plant in the area to supply the concession. The International Finance Corporation, the private arm of the World Bank, contributed to the study and promised its financial support if the project received government approval (Hage Boutros, 2015a; 2015c). In Zahleh, the director of EDZ had been backing a similar idea since 2005, as the government discussed privatising the electricity sector (Verdeil, 2009; Gabillet, 2010). Once such a law had been passed, allowing EDZ to secure an agreement, the company would invest in its own thermal power plant, claiming that it would generate savings through economies of scale. Contacts are underway with local and international lenders. In both cases, the utilities encourage customers to install photovoltaic panels and solar water heaters, but they explain that they themselves cannot rely on renewable energy sources because they need base load capacity, which these technologies cannot at present provide (interviews, September 2016).

Political struggles over the future of electricity in Lebanese cities

The relative autonomy in the public grid, with backup capacity directly run by local utilities and plans to achieve autarchy (i.e., full decentralisation of production and distribution, or self-sufficiency), fuelled and continues to fuel heated political conflict at the local and national levels. Indeed, these future projects raise not only technical issues about the feasibility of quitting the

national grid but also political questions about the future of the nation, since electricity was conceived of as a symbol and instrument of national modernity and unity (Verdeil, 2009; 2016).

The first phase of conflict involved local generator owners. In both cities, they were forcefully evicted from the stage, on the grounds that they encroached on the grid owned by the utility. Though the municipalities backed the move, the generator owners employed a variety of resistance tactics. In Jbeil, they had a degree of political support, which prompted EDJ to offer them the equivalent of one year of lost profits in compensation (Gabillet, 2010). In Zahleh, the generator owners put up physical resistance, shooting at transformers when their wires were cut. However, they lacked both popular and political support locally and are said to have withdrawn without compensation (interview, September 2016; Hage Boutros, 2015b).

In both cases, the move towards electricity decentralisation has been driven by an alliance between local capitalist firms seeking to survive and develop a profitable service and local political forces which see a functioning power system as a source of legitimacy. In Jbeil and Zahleh, time is running short for the families that run the local utilities: the Zahleh licence expires in 2018 and the Jbeil licence in 2023. After this, if they are not renewed or renegotiated, their assets will fall into the hands of the state. Since the beginning of the 2000s, they have been lobbying for privatisation of the sector and have proposed to invest in new electricity generation capacity. They have also invested (or tried to invest) in other government-launched electricity projects, such as bidding for contracts to manage power distribution in three regions (interviews, October 2016; for details on this project, see Verdeil, 2014a). A law on electricity privatisation passed by Parliament in April 2014 opened a new window of opportunity for advancing their aims, and after more than two years of political deadlock in the country, the election of a new president may bring a deal closer.

The local notables in both cities are firmly behind their projects. In Jbeil, in addition to enjoying the support of the municipality, the owner of EDJ is part of a family that has interests in Byblos Bank, one of Lebanon's biggest, and has many political and financial connections in Jbeil and nationally. For example, the main shareholder's uncle was head of the Lebanese Banks Association (Gabillet, 2010). In Zahleh, the company's management has also garnered the support of the mayor and the local members of Parliament and has diversified its political support outside the city. While the firm's stakeholders are dominated by Christian families from a mostly Christian city, the company began in the early 2000s to hire Muslim employees – who now account for some 20 percent of the workforce – from the neighbouring municipalities.

During the 2006 war, EDZ carried out twenty-four-hour repairs to bombed transformer posts in Shia neighbourhoods, which also helped to secure the company wider support in the other parts of its operating zone.

The rhetoric employed in this strategy of building broad local coalitions to back moves towards electricity decentralisation stresses the efficiency of the private sector and its ability to outperform the public utility (e.g., the EDZ advertisement touting the company's ability to light up "our country" (watanna) (Figure 17.4). They enjoy the support of international organisations that for years have been pushing for reform of the electricity sector and have acted as advisers on these projects (World Bank, 2008; 2013). More than this, however, both companies play on what could be termed "local nationalism", drawing on their rhetoric about the wide local consensus in favour of granting the companies the right to generate their own electricity, to pursue their distribution activities, and to argue for political decentralisation in the country. In Jbeil, for instance, EDZ subscribers would be able to bid for shares in the company that would own the new power plant. According to EDJ's CEO, this would instil respect for the asset in the local population and prompt a readiness to pay, whereas state assets are an object of disdain. The new company could then become a model for all of Lebanon's regions (interview, September 2016).

Figure 17.4 EDZ advertising its ability to light up the country.

EDZ, circulated on Twitter, December 2, 2014: https://twitter.com/sharbelfaraj/status/539865236732653568

Indeed, other regional leaders have expressed strong interest in these experiments. Sami Gemayel, heir to a leading family in the Metn area, north-east of Beirut, has incorporated regional decentralisation into his party's programme and has regularly cited the example of electricity (Hury, 2008). Several competing projects emulating those of Zahleh and Jbeil also emerged recently in the city of Tripoli (Hage Boutros, 2016). Local capitalist enterprises are thus piggybacking on aspirations for political decentralisation to promote their projects.

However, they face doubt, incredulity, and resistance from many other interests, specifically inside the state electricity sector. For years, critics have contended that the concessions enjoy unfair advantages that allow them to make profits at the expense of the state (and of citizens) because of the low

price at which they buy electricity from EDL. A representative from the Ministry of Energy considers the recent moves by EDZ and EDJ on electricity production to be illegal, since they infringe EDL's production monopoly. For him, the state simply needs to wait for the licences to elapse in order to take possession of their assets (interview, October 2016). However, the energy minister has never attempted to terminate these popular initiatives. The national utility EDL, its management, and to an even greater extent its workforce have repeatedly made clear their opposition to any privatisation projects (Verdeil, 2009). The EDL union has publicly expressed its rejection of privatisation, and the day workers union, which represents the category of workers with the most to lose, has repeatedly gone on strike in recent years over the subcontracting of their work to private companies and in defence of a public utility (Mandarino, 2016). However, the privatisation bill passed by Parliament in 2014 is proof that many lawmakers do not share this position. There are therefore multiple divisions on this issue within the state and among the political elites.

The electricity decentralisation projects in the cities of Zahleh and Jbeil also raise a number of other technical and political issues about the relations between the local and the national scales. By applying a national tariff, the state not only exercises sovereignty but also maintains social solidarity between small and large subscribers. The de facto subsidy policy pursued in Lebanon since the early 1990s, whereby prices do not rise in line with oil prices on the international markets, can also be viewed as a form of protection from external agencies. Unwilling to fund this kind of protective mechanism, EDZ has begun to charge additional fees to reflect the real cost of electricity generation for subscribers to its extended service. There is currently no discussion about tariffs under the future service, beyond the promise that it will cost less than customers pay with the current double-billing system (generator and EDL). The technical alliance between the potentially decentralised local perimeter and the national grid, to cover temporary supply failures from the new power plants, is another issue that is never mentioned in public debate around the current projects. In both cases, the technical and political articulation between the local and national levels remains opaque.

Conclusion

By focusing on the issue of securitisation of electricity supply in two Middle Eastern countries, this chapter has highlighted the links between state building and power supply and highlighted how the current geopolitics of the region, changes in the oil markets, and internal economic and political dynamics are testing these links and will perhaps lead to the establishment of

new ones. Table 17.2 summarises the result of the analysis. It highlights the diversity of urban energy security strategies, the opposition to them, and a number of common threads that stand out.

Table 17.2 Energy Security Strategy

Energy Security Strategy	Decoupling from large networks and energy diversification	Local politics of energy circuits
Amman: nuclear plant construction project	*National Energy Diversification and Independence Strategy *Towards technological and geopolitical dependence (Russia/China) *Downsizing of the metabolic loop (water/electricity)	*Leading role of the state in designing the energy policy of the capital city region and marginalisation of local actors *Agency of local tribal actors dependent on their connections with the networks of the monarchy
Zahleh/Jbeil: decentralisation of electricity generation and distribution	*Disentanglement from the national grid *No energy diversification (almost no role for renewable energy) and dependence on international markets *National solidarity (technical and political) not considered	*Local capitalist strategy exploiting aspirations to political decentralisation with the support of local political forces *Complicit tolerance or passive resistance of various state segments

Whereas energy security is widely understood in terms of the state's agency in seeking to protect its sovereignty, its population, and its economy, this chapter

has highlighted the emergence of alternative geographies of energy security. They involve new territorial scales, such as city regions or even fairly small urban entities, and – though not always – new actors, such as local capitalist and political elites in the Lebanese case. Energy needs or demands at these scales are imagined as autonomous vis-à-vis larger territories and networks. The specific resources of such territories are also perceived as advantages that can be exploited to achieve a partial rebundling of local circuits, as shown in Amman, stressing the potential for greater autonomy of local circuits.

However, the main driver of this transformation is not the rise of renewable energy technologies, contrary to the assumptions implicit in discourses on energy transition (Dunsky, 2008). The types of energy targeted to support regional or urban rescaling in the examples analysed in this chapter – nuclear and thermal hydrocarbon-based electricity generation – are conventional, not to say old-fashioned.

Larger scales are increasingly conceptualised as threats, or at least potentially unreliable, whereas national power grids were formerly engineered as a means of maintaining the security of supply through the pooling of diverse electricity sources, with regional projects such as the Arab gas pipeline designed to integrate and link Mashriq countries by means of infrastructure and commercial agreements.

The emergence of subnational conceptions of energy security is directly linked to the weakening of the state. Lebanon is clearly a case in point. The technical demise of the state and its inability to reform its power sector and offer its population a continuous energy supply is an argument for electricity decentralisation. It also serves an agenda of greater local political autonomy, eroding the sovereignty of the state. In Jordan the nuclear power project is not associated with any subnational separatist or federalist venture. However, it symbolically highlights the almost unprecedented concentration of wealth and political power in the capital region, turning the peripheries, in particular the surrounding periphery, into disposable spaces which the capital city is free to use regardless of the claims and fears of some ordinary citizens. In addition, the project as conceived reveals the political and financial weakness of the state, which is obliged to place its sovereignty in the hands of foreign powers and of the forces of global capital, though in this case not Western but Russian and Chinese.

To conclude, we need to recognise that these forthcoming transformations remain tentative and full of uncertainty[*]. However, even if these projects do not

[*] As this chapter goes to print, the local situations have changed. In June 2018, the Jordanian government terminated the negotiations with Rosatom and gave-up with the project in Qasr al Hamra because of the

succeed or are significantly altered, the debates they raise illustrate profound changes in the infrastructural ecology of the cities, in the geographical dynamics that are reconfiguring Middle Eastern economies, and in the forces that challenge the state in the region.

Bibliography

Ababsa, M., ed. (2013), Atlas of Jordan: History, territories and society (Beyrouth, Liban: Presses de l'IFPO).

Abu-Dayyeh, A. (2015), "From energy mess to energy management: Jordan as a case study (2007–2020)", Friedrich Ebert Stiftung (Policy Papers). Available at: library.fes.de/pdf-files/bueros/amman/11188.pdf

Abu-Rish, Z. (2014), "Protest, regime security and state formation in Jordan", in M. Kamrava, ed., Beyond the Arab Spring: The Evolving Ruling Bargain in the Middle East (Oxford: Oxford University Press), pp. 277–312.

Ahmad, A. (2015), "Economic risks of Jordan's nuclear program", Energy for Sustainable Development, 29, pp. 32–37. doi: 10.1016/j.esd.2015.09.001.

Balbo, L. (2012a), "Ayoub Abu-Dayyeh is Jordan's environmental champion", Green Prophet, 16 May. Available at: www.greenprophet.com/2012/05/ayoub-abu-dayyeh-is-jordans-environmental-champion, accessed 8 October 2014.

———. (2012b), "Basel Burgan: A force behind Jordan's anti-nuke movement", Green Prophet, 26 December. Available at: www.greenprophet.com/2012/03/basel-burgan-nuclear-jordan, accessed 8 October 2014.

Brenner, N. (2004), New state spaces: Urban governance and the rescaling of statehood (Oxford: Oxford University Press).

Bridge, G. (2015), "Energy (in)security: World-making in an age of scarcity", The Geographical Journal, 181.4, pp. 328–339. doi: 10.1111/geoj.12114.

anticipated increase in the financial cost of the project due to the share of commercial loans Rosatom planned to recourse to. The government is now studying the commissioning of two Small Modular Reactors, a smaller and less expensive technology, and it reconsiders the site of Aqaba as a possible location (Nasr and Ahmad, 2018). On the 29th of November 2018, the Lebanese Parliament voted Law #108 proposed by caretaker Energy Minister Cesar AbuKhalil. It extended for two years the licence of Electricité de Zahlé, after which a bidding process shall be organized. For the first time, the law recognized EDZ's right to meanwhile produce and sell its own electricity. However, the law also called for new measures to calculate (and reduce) EDZ profit margin. Moreover, the city and its suroundings will not become autonomous from the national grid. The projects presented in this chapter will not unfold as planned. The questions they raise however remain.

Bridge, G. et al. (2013), "Geographies of energy transition: Space, place and the low-carbon economy", Energy Policy, 53, pp. 331–340. doi: 10.1016/j.enpol.2012.10.066.

Bulkeley, H. A. et al., eds. (2010), Cities and low carbon transitions (London and New York: Routledge).

Burgan, B. (2015), "Nuclear energy: Questions the world needs to address", Jordan Times. Available at: www.jordantimes.com/opinion/basel-burgan/nuclear-energy-questions-world-needs-address, accessed 15 August 2015.

Chanson-Jabeur, C. et al. (2001), Les services publics et leurs dynamiques au Machreq et au Maghreb : Actes du 27ute2727se organisé du 19 au 21 mai 1999 à Paris (Paris: L'Harmattan).

Coutard, O. and J. Rutherford (2010), "The rise of the post-networked cities in Europe? Recombining infrastructural, ecological and urban transformations in low carbon transitions", in H. A. Bulkeley et al., eds., Cities and Low Carbon Transitions, 1st ed. (London: Routledge), pp. 107–125.

———. eds. (2016), Beyond the networked city: Infrastructure reconfigurations and urban change in the North and South (London: Routledge).

Dunsky, P. U. (2008), "The current electrical revolution: Portrait of a newly emerging architecture in industrialized countries", S.A.P.I.EN.S. Surveys and Perspectives Integrating Environment and Society, 1.2. Available at: http://sapiens.revues.org/302, accessed 7 December 2016.

Gabillet, P. (2010), "Le commerce des abonnements aux générateurs électriques au Liban", Géocarrefour (Services urbains en réforme dans le monde arabe, edited by E. Verdeil), 85.2, pp. 153–163.

Gamba, A. (2015), "New energy sources for Jordan: Macroeconomic impact and policy considerations", IMF Working Papers 15/115. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2623802, accessed 2 December 2016.

Graham, S. and S. Marvin (2001), Splintering urbanism: Networked infrastructures, technological mobilities and the urban condition (London: Routledge).

Hage Boutros, P. (2015a), "Centrale de Jbeil: un premier pas vers la privatisation de l'électricité dans la région ?", L'Orient-Le Jour. Available at: www.lorientlejour.com/article/928243/centrale-de-jbeil-un-premier-pas-vers-la-privatisation-de-lelectricite-dans-la-region-.html, accessed 5 June 2015.

———. (2015b), "Électricité de Zahlé l28ute28son unité de production privée", L'Orient-Le Jour. Available at: www.lorientlejour.com/article/913417/electricite-de-zahle-lance-son-unite-de-production-privee.html, accessed 12 May 2015.

———. (2015c), "Le projet de centrale électrique à Jbeil passé sur le gril", L'Orient-Le Jour. Available at: www.lorientlejour.com/article/951746/le-projet-de-centrale-electrique-a-jbeil-passe-sur-le-gril.html, accessed 28 October 2015.

———. (2016), "Une deuxième société privée en lice pour produire de l'électricité à Tripoli", L'Orient-Le Jour. Available at: www.lorientlejour.com/article/1010925/une-deuxieme-societe-privee-en-lice-pour-produire-de-lelectricite-a-tripoli.html, accessed 5 October 2016.

Hashemite Kingdom of Jordan, Ministry of Energy (2007), "Updated master strategy of energy sector in Jordan for the period (2007–2020)", Summary, p. 26. Available at: www.nerc.gov.jo/Download/english%20-energy%20strategy.pdf, accessed 20 May 2009.

Heynen, N. C., M. Kaika and E. Swyngedouw, eds. (2006), In the nature of cities (London: Taylor and Francis).

Hodson, M. and S. Marvin (2009), "Urban ecological security: A new urban paradigm?" International Journal of Urban and Regional Research, 33.1, pp. 193–215. doi: 10.1111/j.1468–2427.2009.00832.x.

———. (2010), World cities and climate change: Producing urban ecological security (Issues in Society, Vol. 1) (Maidenhead: Open University Press).

Hury, D. (2008), Décentralisation et régionalisme: Un avenir pour le Liban ? Available at: http://chroniquesbeyrouthines.20minutes-blogs.fr/archive/2008/03/05/decentralisation-regionalisme-un-avenir-pour-le-liban.html, accessed14 May 2015.

International Energy Agency (IEA) (n.d.), "What is energy security?" Available at: www.iea.org/topics/energysecurity/subtopics/whatisenergysecurity, accessed 28 November 2016. Available at: www.iea.org/topics/energysecurity, accessed 12 July 2018.

Jaglin, S. and É. Verdeil (2017), "Emerging countries, cities and energy: Questioning transitions", in S. Buzarovsky, ed., The Routledge Research Companion to Energy Geographies (London: Routledge), pp. 106–120.

Khodr, H. and K. Uherova Hasbani (2013), "The dynamics of energy policy in Lebanon when research, politics, and policy fail to intersect", Energy Policy, 60, pp. 629–642. doi: 10.1016/j.enpol.2013.05.080.

Lakhal, S. Y. (2014), "Morsi's failure in Egypt: The impact of energy-supply chains", Middle East Policy, 21.3, pp. 134–144. doi: 10.1111/mepo.12088.

Leenders, R. (2016), "The first time as tragedy, the second as farce? Lebanon's Nascent petroleum sector and the risks of corruption", Mediterranean Politics. Available at: www.tandfonline.com/doi/abs/10.1080/13629395.2015.1117168, accessed 7 January 2016.

Luque-Ayala, A. and J. Silver, eds. (2016), Energy, power and protest on the urban grid: Geographies of the electric city (London: Routledge). Available at: http://public.eblib.com/choice/publicfullrecord.aspx?p=4516582, accessed 24 November 2016.

Magid, A. (2016), "Time to reconsider Jordan's nuclear program", Middle East Institute. Available at: www.mei.edu/content/article/time-reconsider-jordan-s-nuclear-program, accessed 2 December 2016.

Mandarino, L. (2016), "De la pérennisation d'un statut préca29ute la lutte pour la titularisation : Un regard rétrospectif sur la mobilisation des journaliers de l'Électricité du Liban (EDL)", Civil Society Knowledge Centre. Available at: http://cskc.daleel-madani.org/paper/de-la-perennisation-dun-statut-precaire, accessed 3 July 2016.

Mason, M., M. A. Al-Muhtaseb and M. Al-Widyan (2009), "The energy sector in Jordan – Current trends and the potential for renewable energy", Renewable Energy in the Middle East, pp. 41–54. Available at: http://dx.doi.org/10.1007/978-1-4020-9892-5_3, accessed 29 January 2010.

Mitchell, T. (2011), Carbon democracy: Political power in the age of oil (London and New York: Verso).

Monstadt, J. (2009), "Conceptualizing the political ecology of urban infrastructures: Insights from technology and urban studies", Environment and Planning A, 41.8, pp. 1924–1942.

Nasr, J., Ahmad, A. (2019), Middle East Nuclear Energy Monitor: Country Perspectives 2018 (Beirut: Issam Fares Institute for Public Policy and International Affairs). Available at: http://www.aub.edu.lb/ifi/Documents/publications/research_reports/2018-2019/20190103_middle_east_nuclear_energy_monitor_country_perspectives_2018.pdf, consulted 27th of March 2019.

Pasqualetti, M. J. and M. A. Brown (2014), "Ancient discipline, modern concern: Geographers in the field of energy and society", Energy Research and Social Science, 1, pp. 122–133. doi: 10.1016/j.erss.2014.03.016.

Ramana, M. V. and A. Ahmad (2016), "Wishful thinking and real problems: Small modular reactors, planning constraints, and nuclear power in Jordan", Energy Policy, 93, pp. 236–245. doi: 10.1016/j.enpol.2016.03.012.

Rutherford, J. and O. Coutard (2014), "Urban energy transitions: Places, processes and politics of socio-technical change", Urban Studies, 51.7, pp. 1353–1377. doi: 10.1177/0042098013500090.

Sovacool, B. K. (2013), "Introduction: Defining, measuring and exploring energy security", in Benjamin K. Sovacool, ed., The Routledge Handbook of Energy security (London and New York: Routledge), pp. 1–42.

———. (2014), "What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda", Energy Research and Social Science, 1, pp. 1–29. doi: 10.1016/j.erss.2014.02.003.

Swyngedouw, E. (2006), "Circulations and metabolisms: (Hybrid) natures and (cyborg) cities", Science as Culture, 15.2, pp. 105–121.

United Cities and Local Governments (2008), Decentralization and local democracy in the world (Barcelona: UCLG).

Verdeil, É. (2009), "Electricité et territoires: Un regard sur la crise libanaise", Revue Tiers Monde, 198, pp. 421–438.

———. (2014a), "Les services urbains à Beyrouth: Entre crise infrastructurelle et réformes contestées", Géosphères, Annales de Géographie de l'Université Saint-Joseph, 33.34, pp. 35–58.

———. (2014b), "The contested energy future of Amman, Jordan: Between promises of alternative energies and a nuclear venture", Urban Studies, 51.7, pp. 1520–1536. doi: 10.1177/0042098013500085.

———. (2014c), "The energy of revolts in Arab cities: The case of Jordan and Tunisia", Built Environment, 40.1, pp. 128–139.

———. (2016), "Beirut, metropolis of darkness and the politics of urban electricity grids", in A. Luque-Ayala and J. Silver, eds., Geographies of the Electric City (London: Routledge), pp. 155–175. Available at: https://halshs.archives-ouvertes.fr/halshs-00858126, accessed 13 April 2015.

World Bank (2008), Republic of Lebanon electricity sector public expenditure review: 41421 – LB, World Bank Sustainable Development Department, Middle East and North Africa Region (Washington, DC: World Bank), p. 89.

———. (2013), Lebanon – Emergency power sector reform capacity reinforcement project, ICR2675 (Washington, DC: World Bank), pp. 1–50. Available at: http://documents.worldbank.org/curated/en/2013/06/17991357/lebanon-emergency-power-sector-reform-capacity-reinforcement-project, accessed 25 March 2015.

———. (2009), Lebanon social impact analysis – Electricity and water sectors, 48993 – LB. World Bank Social and Economic Development Group, MENA Region (Washington, DC: World Bank). Available at: http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/07/21/000333038_20090721001206/Rendered/PDF/489930ESW0P0891C0Disclosed071171091.pdf.

World Nuclear Association (2016), Nuclear power in Jordan. Available at: www.world-nuclear.org/information-library/country-profiles/countries-g-n/jordan.aspx, accessed 2 December 2016.

Note

1 The project consists of two reactors that would produce 1060 MW each. Delays in commissioning have led to construction being postponed to 2023–2025. For details, see Verdeil (2014a).

2 This and the accusations that followed were expressed during an interview with Hind al-Fayez, a member of Parliament, recorded in Amman in October 2014. Several press and online publications support similar claims (see e.g., Balbo, 2012a; 2012b; Abu-Dayyeh, 2015; Burgan, 2015).

3 In order to maximise their profits, the private distribution companies have strong incentives to prevent non-payment and poaching. EDZ is keen to publicise its management performance in order to justify its existence, as it is regarded as a temporary anomaly until its absorption by EDL when its operating licence expires. See "About EDZ. Awards and Achievements", available at: www.edz.com.lb/tabs-page.aspx?pageid=6, accessed 8 December 2016.