

***REFGOV***

*Reflexive Governance in the Public Interest*

***Institutional Frames of Markets***

**Comparing the Governance of  
Competitive Change  
in the Water and the Electricity Industry.**

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## ***Annexe 8: Comparing the Governance of Competitive Change in the Water and the Electricity Industry***

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The effects of European policies on network industry governance are often presented as a continual erosion of the public sector to the benefit of the private, thereby consolidating the growing trend towards substituting the market for public regulation. This interpretation is understandable and approximately correct if we use the former industrial and regulatory system as our only economic framework for analyzing the transformations underway (Glachant, 1994, 1996 and 1997). However, changes in economic analysis over the last decades, specifically with regard to New Institutional Economics (R. Coase, D. North, O. Williamson, P. Joskow, etc.), show that network industry governance issues cannot be reduced to the binary classification of “public sector + public regulation” versus “private sector + market” (Glachant, 1994, 2002 et 2003). New Institutional Economics helped us understand that the governance of network industries includes a large and varied set of “implementation arrangements” among industrial structures, market exchange operations and transaction chains (Joskow, 1996 and 2002; Glachant, 1998; Glachant & Finon 2000; Crocker & Masten, 1996). Of course, public intervention, whether direct or indirect and targeted or general, can disrupt the arrangements connecting these fundamental determinants of forms of governance (Joskow & Schmalensee, 1984; Joskow, 1989; Williamson, 1991; Levy & Spiller, 1996). However, public intervention alone cannot determine everything. This is because institutional and transactional rationales linking the determinants of governance forms are not exclusively legislative or political in nature (Williamson, 1976 and 1985; Curien, 2000; Newbery, 2000; Noam, 2001; Glachant, 2000, 2005 and 2006; Joskow, 2006).

Changes in the water and electricity network industries in France in response to European policies offer an interesting example. To simplify slightly, European water policy should have produced only a limited and selective change in France. Throughout the 1980s, quality standards were increased, with the French governments’ complete agreement, by raising the existing minimum quality criteria and adding new ones. Although the European water markets all operated as local or regional monopolies, this should have brought them closer together by standardizing the characteristics of the products delivered. However, the long-term impacts of this apparently modest policy were extremely significant. Today, this European-wide tightening of quality standards is seen as one of the major problems facing local government-owned public monopolies and as creating a major opening permitting large French private water companies to pursue their ambitions.

On the other hand, however, European legislation in the electricity sector (directives and regulations; *cf.* C. Jones, 2004) targeted industry structures and the role of markets directly by forcing the hand, step by step, of successive French governments (European Directive of 1996 – French Law of 2000; European Directive

and Regulation of 2003 – French Laws of 2004 and 2005). The European framework effectively stripped the dominant French electrical operator of its functions by separating the operation and management of its networks from the operation and management of its production and sales. Furthermore, the new European framework created an open market where all producers along France's borders – made up of six electricity borders – can inject their electricity and where, as of July 2004, two-thirds of French consumption may freely choose their electricity suppliers. However, this vigorous policy did not displace the managers of French public network monopolies. Rather, they increased their involvement in the operation of new markets and their international expansion.

The “minor” European water unification appears to have put the French public networks at risk, whereas the “major” electricity unification seems to have put them in the spotlight. This could be seen as paradoxical, but it is not. The key to these differences is not to be sought in the origin of the change (more European vs. more national) or in its initial political tone (more neutral and consensual in the case of water; more constraining and conflictual for electricity). Rather, the differences arise from the fact that the changes are not operating on the same governance rationale: the same network industries with the same transaction chains.

### *I – The Starting Point: Previous Water and Electricity Governance Systems*

The traditional governance of water and electricity networks in France is typically presented as a two-dimensional matrix of operational integration: industrial integration and regulatory integration. This is a useful starting point because both are of equal importance.

In network industries, industrial operations dealing with production, transportation/distribution networks, and sale of the product may be integrated in the framework of unified ownership. This is the industrial system known as “vertical integration,” in which coordinated operational and development activities are carried out under the auspices of a single hierarchy supported by unified property rights. Later, this industrial regime also came to be known as a “bundled” system, since it linked the different industrial functions. This also distinguished it from the new “unbundled” system that would come to be considered as a prerequisite for competition.

Independently of this industrial integration among functions, the definition of operators' rules of economic and business behavior (specifically, the definition of service qualities and rate structure rationales) was also subject to institutional separation from or integration with the operator. The French model of regulatory integration, via a self-regulating “operator-regulator” was clearly asserted by former EDF president Marcel Boiteux, also one of the great theoreticians of rational economic rate-setting for public monopolies (Boiteux, 2004). The American model of separation represents the opposite approach, in which responsibility for defining rules and supervising implementation are placed under the authority of a public institution independent of the operator - the industry regulator (Clark, 1904; Joskow, 1989; Glachant, 1996).

Now that we have identified these two aspects of industrial integration and regulatory integration, we have to introduce a third. This third issue has remained on the sidelines because it was of minimal importance under the former widespread French public monopoly system. It is the transaction chain. This chain could be confused with the industrial and regulatory aspects of integration, when the same

authority designs and carries out all operations aimed at supplying consumers. This transaction chain also returns to the foreground, distinct from the industrial and regulatory aspects, when the implementation of exchanges among producers, sellers and consumers is no longer combined either with industrial integration or regulatory integration. This is what competitive reforms, specifically in the electricity arena, would teach – or remind – us (Joskow, 1996 and 2003; Glachant, 1998 and 2003-a and -b).

## *II – Small Change versus Major Change: The New Industrial and Regulatory Systems in the Water and Electricity Sectors*

The new industrial and regulatory systems in the French water and electricity sectors offer a clear contrast between an initial small change and an initial major change.

The new European regulations redefining water quality appeared to constitute only a slight change. They did not affect traditional French industry structures, characterized primarily by vertical integration of the process of producing drinking water, delivering it via a network and selling it to the end customer. This European regulation did not require the separation of operator (public monopoly) and regulator (local authorities). Its only institutional innovation was to suspend, in practice, the power of local authorities to regulate local water quality. However, this innovation would have a particular impact on the public water sector, where local authorities operated as both local industrial operators in the production and delivery of the product and as local regulators of its quality and price. While remaining responsible on the industrial and regulatory level, local authorities lost the standard power of the operator-regulator, which is to define the relevant features of its product and the standards for evaluating its quality control process. The full institutional impact of the regulatory innovation can be seen in this partial unbundling of the job of water quality regulation and all the other functions of the local public operator-regulator.

On the other hand, the new European regulation dealing with the electricity sector represented a major change from the start, although it did not address the standards for evaluating the quality of electricity delivered to consumers. It performed major surgery on institutional and industrial relationships by creating a functional separation, on the one hand, of all the regulator's functions from those of the operator and, on the other, all transmission network operations and distribution network operations from other competitive functions in the area of generation and supply. Adding yet another dimension to this fundamental separation, the new regulatory system created an open market in France and at each of its borders, allowing every seller and every consumer to freely enter into trading agreement (with the exception, until July 2007, of residential consumers).

## *III – The Real Center of Gravity of the Changes: Market Operations and Transaction Chains in the Water and Electricity Sectors*

In truth, European policies do not represent the center of gravity of the changes. These policies do not create the real change; rather, it is their interactions with market operations and their corresponding transaction chains that drive change.

In the water sector, the change has occurred in the product's physical-chemical characteristics, rather than in the operator's industrial and regulatory framework. The product to be placed on the "new" market must meet new and rigorous physical-

chemical standards that are no longer defined or verified exclusively or primarily by the local public operator-regulator. Third party and independent authorities connected directly to the French government's health authorities now have the right and the duty to intervene in the local chain of standardization, monitoring and evaluation.

However, the direct ambit of local public operators-regulators' industrial and business operations was not changed. Each of them maintains its local monopoly for supplying customers in its geographic region, as well as its institutional monopoly authorizing it to regulate other aspects of service including price, conditions of service and connection and investments. In transactional terms, the product's key useful physical-chemical characteristics are now determined by a public third party, who is neither the producer-seller, the consumer, nor the local regulator. At the same time, all other aspects of the transactions are still conducted in an exclusively bilateral framework in which all consumers in the same region turn to the same producer-seller with their requests for supply volumes. That producer-seller operates the single supply network on a monopoly basis, according to its conditions for providing water and at its price.

In the electricity sector, on the other hand, the change focuses on the operator's industrial and regulatory framework, rather than the product's physical-chemical characteristics. In physical-chemical terms, the electricity product on the "new" market has not changed, which is to the best because the equipment and facilities required to produce, transmit, distribute and consume have a very low tolerance for changes in the physical properties of the electric current. The electric current itself is established and maintained within very narrowly defined physical values. We are all familiar with the phenomenon of the "blackout," a powerful illustration of the current's low tolerance for its own variations.

However, the direct framework governing electrical systems' industrial and commercial operations experienced a profound change, particularly for network operators. First, all their operational and network investment activities must now be conducted completely independently from the production and sales departments of their formerly integrated enterprise. This arrangement was new in France, where those two halves of *Électricité de France* (EDF) had been closely coordinated and connected for more than 50 years. Second, a public authority, operating independently of the company and the government, would henceforth regulate network operations and investments. Finally, as of July 2004, the national market and all its borders were opened to all producers and sellers interested in supplying any of the four million "eligible customers."

In transactional terms, the electricity product's primary useful physical characteristics were still fixed by technical rules established before the competition policy reforms. These rules are implemented under the direct authority of Transmission System Operators, acting here as network "technical regulators." Observing these rules ensures a product of standardized and, in principle, uniform quality across the entire national high voltage transmission grid. This technical uniformity (i.e, a product of uniformly high quality) allows electricity to flow very quickly and in large volumes across the entire transmission network, not only nationally but across the full European grid. However, to ensure that the product's "physical" quality is consistent and that electricity will flow continuously through the networks, network managers must also intervene in a variety of other aspects of bilateral market transactions. This is because all consumers, regardless of location, may now seek electricity, by volume and by price, from any of the dozens of sellers or producers-sellers now competing for their business, even as the electric current

flowing along the transmission network remains a ... single, unified and impersonal product, thus collective and indivisible by nature!

Under these conditions, it is still very difficult to implement the most commonplace market operation – matching individual consumers, sellers and producers in terms of volumes and prices they set directly among themselves – in the electricity sector. This matching function, which is at the heart of market transactions, can be carried out because network managers take responsibility for the central logistics of producers' markets and, in particular, for the physical clearing function and financial settlement among the players in the producers' market, also known as the "wholesale market." In practice, network managers handle the logistics of central market intermediation, specifically including: - the centralization of the bilateral projected supply and demand schedules, including imports and exports planned at the borders of their control areas; - the continuous metering of all flows injected into and withdrawn from their networks and of all other relevant physical parameters; - a direct action on power and energy volumes and, sometimes, their location in order to maintain an overall real-time supply and demand balance at all times; - and, finally, the reconciliation of all these data so that business and financial responsibility for imbalances detected between forecasted schedules (the commercial and financial expression of transactions carried out on the markets) and real flows (the physical expression on the network of effective energy supply and demand) can be distributed among network users.

#### *IV – The Logical Loop between the New Transaction Chains and Governance Changes in the Two Industries*

The rationale behind the governance changes can be now clarified by comparing the changes resulting from European regulations and the corresponding transaction chains.

In the water sector, each public operator-regulator operating as a monopoly in its local area is responsible for the quality of water delivered and, thus, for its success or failure in meeting the new quality standards. However, the primary resource processed – primary water – is, by its nature, a heterogeneous resource. We may assume that the local water production and distribution chain in each area was designed to treat the local resource in accordance with prior local quality standards. Of course, every operator-regulator may invest in new technical processes to meet the new standards. However, the existing industrial and regulatory framework is not particularly favorable to the adaptation of local transactions via local innovation across many small units. France is one of the European countries with the highest number of local authorities that also happen to be the smallest, relative to the number of residents (more than 30,000 municipalities for 60 million residents). It is difficult for small local units to commit capital and human resources to such technological and industrial innovation processes, which are typically managerial and entrepreneurial. Local authorities can, of course, join forces to achieve critical mass. However, mergers or acquisitions among local authorities are long and difficult political processes, recognized since the early 20<sup>th</sup> century as one of the most significant institutional obstacles to achieving economies of scale in producing local services (Pigou, 1920). If local public operators-regulators do not quickly and aggressively commit to expanding their operational areas to jointly create new procedures, equipment and human resources, they are unlikely to achieve the new quality goal within the established deadline. Even if the French government is less than zealous

in implementing strict controls on actual local water quality, such governmental flexibility only encourages the *status quo* because it relieves pressure on local operators-regulators to improve quality.

Throughout this transition from the former quality standards to the obligatory implementation of the new ones, the large private French water companies (La Générale, La Lyonnaise and La Saur), which operate nationally and are world leaders in their field, will be able to increase their technological, industrial and managerial lead. They have access on an international scale to equity capital and borrowing power, central laboratories and R&D divisions, engineers and professional managers. They are already managing hundreds of local concessions, with strategic unification underway at a central level. They have many decades' experience in negotiating case-by-case agreements with local municipalities with limited commercial or technical skills. They are also accustomed to being criticized for increasing the price of water to pay for their monopoly on innovation. They are thus fully prepared to make a strategic entry and take control of the local transaction chain (production, distribution and purification) of the local public operations-regulators, which find themselves in disarray or decline, by proposing a variety of choices in the areas of investment and upgrade, from technological to industrial, human, managerial or financial.

In the water industry, the new dominant rationale of governing transactions into the links of the industrial and commercial chain, and with the local regulator, is now embodied in the new quality standards. The agent who masters the implementation of these quality standards will achieve - from all other partners in the chain and whether by choice or obligation - a central position in the network's governance.

In the electricity sector, on the contrary, the technical and regulatory definition of the product's physical nature has not changed. The process by which it is implemented remains, today as previously, that of supporting the security of the transmission network's operation. Initially, the change was in the separation of monopoly industries (typically, the networks) from competitive ones (typically, generation and supply). The promotion of markets and competitive mechanisms, like coordination procedures between electrical energy suppliers and seekers, was also particularly important. In principle, affirmatively creating markets located at the center of the electricity system would thus decrease the importance of older functions operating as monopolies, which are at the heart of network managers' skills. If the experience in the electricity sector reflected that of the computer and telecommunications sectors, network managers would be responsible only for the passive part of the sector - infrastructure - and would find themselves with the less-than-strategic function of being the electricity "superhighway caretaker," while brokers, traders, power exchanges and suppliers occupied a central place in the new chain of market transactions.

However, in reality, the electricity markets and the agents who trade on them do not alone know how to implement the energy transactions they have concluded. Effective implementation of market transactions (by production, supply/delivery and then consumption of the electricity product) requires that network managers provide operational management of electricity flows. They are the only ones who know how to manage the merging, in real time, of hundreds of physical injections and withdrawals into a single, continuous flow of electrons. They alone know how to analyze, *ex post*, flow variations using databases and specialized measurement equipment. They are thus able to match physical flows and exchanges of property

rights, and deduce from them the centralized settlements that carry out the clearance of bilateral, commercial and financial commitments entered into on the markets.

In the electricity sector, it is the “market process” which was imposed as the dominant rationale to govern transactions on all the the industrial and commercial chain as well as with the regulators. Then the agent who masters the implementation of this market process will achieve - from all other partners in the chain and whether by choice or obligation - a central position in the network’s governance. This central agent is neither the energy supplier nor the seeker, not the producer, seller or consumer and, finally, he is not the new sectoral regulator, either. He is the network manager. In Sweden, which has come a long way in acknowledging this indisputable fact, competition reform law made the transmission network manager a public authority, on a par with the energy regulator. In the US, known for its unbridled professional pragmatism, the new network managers (named *Independent System Operators*, or ISOs) are now virtually unaccountable to old regulators (state *Public Utilities Commissions*). These ISOs have become semi-public, self-regulated institutions, with direct responsibility only to the federal regulator (FERC).

To conclude, the impacts of the innovations initiated by the new European rules in the water and electricity sectors do not correspond to those imagined at the time they were adopted.

The moderate nature of the water sector reform was essentially based on raising quality standards, with a fairly long deadline for achieving those upgrades. In the end, it destabilized the French environment of many small-scale public operator-regulators who ran local public monopolies. Mastery of the new quality processes has become key to the entire transaction chain in each local monopoly area. It is difficult for local public operators-regulators to acquire the necessary skills and resources achieve this mastery, thus opening a strategic breach for large French companies to expand in their areas, although the local municipalities’ public monopolies are still in force there.

The extensive reform of the electricity sector set out to place markets at the heart of the electricity system and to permanently neutralize network monopolies by unbundling them and establishing sectoral regulators. In practice, however, this reform established the network manager as the keystone to the entire transactions chain. In reality, effective implementation of energy market transactions rests on the circulation of a single, common and still fragile flow of electrons, subject to risky distortion or disruption. This is what forced all competition reforms to push network managers - willingly or by force - to the forefront in designing and operating the governance of the new electricity systems.

In the water realm, the little white organic swan has thus turned black, while the big black electronic swan has become white again. The prediction was different at the time of their birth. It is now clear that this did not occur by some act of black magic, but because transaction chains and governance devices perform their transformations in the context of a rationale of institutional complementarity.



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