Prices as Political Signals: Liberalization, Retrenchment and Market Design in the French Electricity Sector

Thomas Reverdy
(Corresponding Author)
Grenoble-INP, PACTE, University of Grenoble
46 av Félix Viallet
38031 Grenoble Cedex 1
thomas.reverdy@grenoble-inp.fr

Daniel Breslau
Department of Science and Technology in Society
Virginia Tech
Blacksburg, VA 24061-0447
USA
dbreslau@vt.edu

Prices as Political Signals: Liberalization, Retrenchment and Market Design in the French Electricity Sector

Market prices, according to neoclassical theory, are efficient signals to market participants. But in many market contexts, and acutely in markets intended to address a collective concern, price is also a political signal. Prices can signal the activation of an alternate frame of valuation, that calls the market mechanism into question. In the case of liberalization of the electricity market in France, and its integration with the European wholesale market, high prices initiated a prolonged contention over the determination of electricity prices. Based on interviews with key participants and analysis of the documentary record and associated professional literature, the article traces a series of efforts to reach a political accommodation. The first attempt consisted of providing a hedging mechanism within the market, by encouraging long-term contracts for power. The second proposed solution consisted of a regulated tariff that was unacceptable to the powerful institutional supporters of liberalization in the French state and the European Union. Finally, an arrangement was adopted that designated historical nuclear power to be segregated into a regulated rate, while the rest of the industry was subject to market prices. Thus the coexistence of two powerful sets of actors, and two institutional orders, was incorporated in the design of the market itself, as the coexistence of two regimes of valuation.

Keywords: France, electricity market, regulation, competition, liberalization

Introduction

According to neoclassical theory, prices convey information. They coordinate collective behaviour by signalling to actors, in pursuit of their own utility, the most efficient use of resources. This is perhaps the most important selling point of markets when promoted for achieving public objectives. State actors do not have to be versed in welfare economics, or the Austrian theory of markets as information processors, to be attracted to the possibility of retreating from direct control of allocation of state resources. Using price signals rather than bureaucratic control to address collective concerns, markets promise to depersonalize and thereby depoliticizing public action. Electric power, which has features of a commodity as well as an essential service, or even a right, has been subject to public contention in North America and Europe, especially since the continuous reduction of production costs came to a halt in the 1960s and 70s (Hirsh, 1999). And advocacy of market reforms for electric power recommended markets for their ability to integrate the consumers of electricity into a control system by means of price signals (F. C. Schweppe et al., 1980; Fred C. Schweppe, Caramanis, Tabors, & Bohn, 1988). Indeed, some actors at the pinnacle of France's state electric power industry have considered the liberalization process as an opportunity to achieve autonomy from the government and parliamentary politics (Reverdy, 2014).

But the functioning of prices as effective signals presupposes some stringent institutional conditions. Not only must market actors have the means to compare goods and prices and calculate accordingly (Callon, 1998; Garcia-Parpet, 2007), those subject to pricing must be left with no alternative than to accept the market price. Neoclassical theory assumes that the market, as a frame of reference, is inescapable, that market participants experience prices as an external fact. The neoclassical hermeneutics of price, based on a free self-interested calculus, is founded on a compulsion that excludes

alternative interpretive frames. But prices act as signals only by imposing real costs and benefits on market participants. They affect distribution of income and wealth and economic health or even survival. Rather than adopting the market frame and performing the calculations of a market actor, actors can read the price as a political signal, prompting defection from the market itself. If actors are able to refuse to delegate price-formation to the market, to refuse the market itself, then the market fails.

The failure of prices is more likely in cases of markets for collective concerns (Geiger, Harrison, Kjellberg, & Mallard, 2014), that have, in addition to facilitating trade, the additional goal of efficiently providing a public good. When public action is carried out through market mechanisms, its provision is implicitly or explicitly compared to the bureaucratic logic of state action. If there is an intact "policy legacy" and state capacity to carry out the function has not been dismantled, it will provide an alternate frame for reading prices (Vogel, 1996; Zelner, Henisz, & Holburn, 2009). Under these circumstances, prices deliver a dual message. Within the frame of the market, participants read prices through the calculus of economic actors. They calculate returns, optimal quantities to purchase. And they based investment decisions on projected future returns, a function of projected market price. But, responding to the price itself, they can invoke the pre-existing evaluative framework. In the case of the electric power industry, to be discussed in this paper, liberalization confronts an entrenched set of longstanding mutual obligations between producers and consumers. As obligations, these relationships are not purely commercial, but can be overlaid with regional, political, and national identification. Regulated power systems, in most countries, are products of development strategies and industrial policies, that are invested with national aspirations. Industrial consumers and state-owned or managed suppliers are therefore not strictly competing commercial entities, but participants in a

national project. The remnants of this policy provides an alternate frame for evaluating prices, and a base for actors to refuse to delegate pricing to the market.

According to the frame of the competitive market, justification of prices is independent of the short-term level of prices themselves. Arbitrarily high prices can be rationalized if they are produced by a mechanism that in the long term realizes the market's promised objectives of efficiency and welfare. By contrast, a regime of regulation, that is an integral part of an industrial policy and strategy of national economic development, is mobilized to compare prices to the production cost of the commodity in question. As will be disclosed in the case below, the French electric industry has been tied to national industries in a relationship of mutual obligation in service of a policy of industrial development. Market and industrial policy constituted two different regimes of valuation (Fourcade, 2011) for the same service.

This article examines a case of political failure of a market when the response of powerful actors to unexpectedly high prices was to defect from the liberalization project. Here conflict over price in a newly liberalized market, a market to accomplish a public goal or answer a collective concern, takes the form of a conflict over the institutional frame in which prices are formulated and evaluated (Fligstein, 1996). This does not mean that market and regulated trade are two totalizing and mutually exclusive universes of valuation. Under conditions such as those described in this article, where neither liberalizing forces nor the regime of national industrial policy is able to decisively impose its frame on prices, the actors experiment iteratively with a series of accommodations. The result is not, as conventional analyses have it, a "retrenchment" of state regulation of the electric power industry, but a hybrid structure that incorporates a cost-based regulated price mechanism for certain strategic actors. The outcome, provisional itself, consists of a coexistence of opposed valuation regimes

The case – liberalization of the French electric power industry

The case study presented in this paper is part of a project (2004-2010) focused on the adaptation of French industry to energy sector liberalization including gas, electricity, and energy services (Reverdy, 2014). More than 100 interviews have been done, mainly with energy suppliers and industrials clients. For this paper, the focus is limited to the electricity market and is based on interviews with academics (3), parliamentarians (2), administration (2), energy regulation commission (1), energy suppliers (3), industrial customers (4). The interviews lasted between 1 and 2 hours and were mostly carried out in interviewees' place of work. The interviews were transcribed and then analyzed. Interviews were helpful to understand the decision process and to get some key documents (like the exchange of letters between the French government and the European Commission). The article also based on an analysis of official documents (public reports, bills) and press articles. The written transcriptions of the public conferences (each year between 2004 and 2010) of the 'Club Energie et Développement', a French association presided by the parliamentarian François-Michel Gonnot, was also helpful in tracing the political debates.

During the first years of liberalization in continental Europe, the European Commission and national regulators had been working to develop an integrated European market for electricity. They pursued this aim by facilitating cross-border trade, by organizing a network of independent regulators in each country, by establishing interconnected spot markets, and by limiting the influence of existing monopolies. The term deregulation would be misleading as a description of these reforms; whatever the benefits of competition, they cannot be realized spontaneously by freeing prices from regulation. Trades in electricity must conform to the technical requirements of the power system, particularly the transmission grid, and must be coordinated with the operation of the grid itself. Operators themselves match offers and

bids in the market in a way that is compatible with the optimal flow of power. Due to the high concentration of ownership in the power industry, market monitors constantly track prices relative to the predicted competitive prices and invoke 'mitigation' measures to limit the exercise of market power. Rather than enforcing competition itself, they insist that prices should approximate the predicted outcome of a competitive market (Breslau, 2011). Regulators also actively monitor the market, and enforce open access of new entrants to the network.

French industrialists campaigned in favor of liberalization before the European Commission. Taking into account the country's specifics, and especially France's extensive reliance on a baseload served by nuclear power and hydropower, the government believed that short-term effects of the liberalization on the sector organization would be negligible. The government was confident about the long-term advantages. At most, it expected to see some new renewable energy players, whom they indeed intended to promote. The government focused above all on maintaining cohesion with other European countries. When the market was opened, most energy-intensive industrialists[1] exercised their eligibility, i.e. their right to buy electricity on the free market when it was opened (except those benefiting from a long-term contract at a preferential rate). Prices on the wholesale markets initially declined, confirming the "promise" of their promoters.

The European market, as developed from 2000, benefited from the accumulated expertise and devices developed in other countries, particularly the United States, where

[1] In 2000, the industrial sites that consume more than 16 GWh per year were affected by the opening of the market. They represented 30 % of the load of electricity, 107 TWh and 1300 sites.

liberalization has led to a variety of relatively successful experiences. The international network of economic experts, through experience with a range of power systems and regulatory jurisdictions, has arrived at a general model for wholesale electricity markets, and this model serves as an institution (Scott, 2001). This institutionalized market is supported by theorized representations, technical devices, computational techniques, and specialized training. The design that has been adopted in most instances of restructured wholesale markets, and of which the European market is one variation, uses a centralized price-calculating algorithm that approximates the theoretical price that would be achieved in an idealized competitive market. It consists of a day-ahead auction in which generators submit quantities and prices for every hour of the next day. Buyers submit their bids, which are generally simply quantities demanded for each hour, with some buyers also specifying the highest price at which they are willing to buy each unit of power. The offers are aggregated, and when arranged in "merit order" from lowest to highest price, form a supply curve. The aggregated bids form the demand curve. The point of intersection of the two curves determines the market price to be paid by all buyers. A separate price is calculated for each hour of the day. All offers at the market-clearing price or lower receive that price for their offered power, while those who offered at a higher price are not dispatched – they have been priced out of the market. Figure 1 provides a simplified illustration of the procedure for determining electricity prices.

Under competitive conditions, the supply curve for power will reflect the different operating costs of generating technologies. Although nuclear plants involve enormous initial capital investments, the cost of generating each megawatt hour of power is much lower than most other types of generation, particularly those using fossil fuels. Coal-fired plants, though not used extensively in France, have a somewhat higher

cost of production. Various types of natural gas-fired plants cost even more, and are bid into the market at a higher price. Peaking plants, with high-cost fuel and low efficiency, but which can be quickly ramped up or down, are the highest priced source. The demand for power, or load, at any time determines which type of plant will be "marginal," will be the highest-priced generator running at that time. The price of the marginal plant sets the price for the entire system. When the load requires the use of more expensive sources, a condition which occurs during most daytime hours, nuclear plants will receive a price set by those more expensive sources, and well above their own production costs. They thus get to pocket an "inframarginal rent", the difference between the market price, set by higher-cost marginal suppliers, and their own production costs. Part of that rent is needed to recover the cost of the initial investment and pay for other fixed costs. It can amount to a substantial profit in a context of scarce capacity of production.It can also lead to important loss, in a context of overcapacity, when the price fall down at the level of variable costs and does not cover investments.

Due to this price short term mechanism, electricity wholesale prices are highly sensible to the appropriateness of installed power capacities with power consumption. The price signal should contribute to a rapid adjustment of capacities but, as some capacities need time to be build or closed, the equilibrium is not reach easily. That is why market prices could be very far from average costs for a long time (the delay of the building of new capacities).

Market actors have agreed, together with the regulator, to adopt this calculation formula, which is also used by regulators in market control. Indeed, this market is subject to close monitoring of prices and investments to verify that there has been no collusion or abuse of dominant positions (Joskow, 2003)The actual price and generator bids are continually compared to theoretical prices based on the prediction that the price

in a competitive market should reflect the marginal costs, and generators should, under ideal competitive conditions, submit bids based on their own costs.

Finally, the construction of a European electricity market requires the coupling of the various national markets. Border connections, previously developed for the sharing of power and infrastructure during extreme events, were expanded for the purpose of full integration. A truly integrated market requires the free flow of power across borders, which can only be achieved by greatly relieving transmission bottlenecks at national frontiers. These couplings have been systematically sought inside Europe through an economic integration policy. The evolution of the material and contractual infrastructure has been complemented by a data communications infrastructure that has gradually connected transactions between market players from one country to another, thus constituting interconnected European markets.

Freer markets, higher prices

Shortly after the adoption of a competitive wholesale market in 2000, economic and political actors were faced with a large and unanticipated rise in prices, lasting from 2004 until 2008. After initially benefitting from a particularly attractive price compared with the regulated tariff, electricity buyers faced a substantial increase, to such an extent that the market rate consistently exceeded the regulated rate. Electricity-intensive industrialists were the first to point out this increase in 2003. With their extensive experience with negotiating cost-based prices for power, the industrialists had intimate knowledge of the production costs of their major suppliers of power. Viewed from the perspective of their historic relationship with the power suppliers, the market prices were now well above the costs of the nuclear plants, and were therefore unjust and unjustified. The industrialists publicly expressed their concerns: they felt that the low prices they obtained during the first years had been a trap, and they suspected that the

producers had colluded to manipulate prices. The highly concentrated structure of the market, with competition limited to a small number of large incumbent producers, seemed to support the plausibility of collusion or "economic withholding," the submission of bids well above production costs.

Faced with the industrialists' mobilization, the French government was slow to react. It also benefitted from the higher revenues earned by the largely state-owned fleet of nuclear power plants. During this period, the Finance Ministry was preparing actively to sell off some of the capital of the state electricity producer EDF to private investors. Given the context, EDF's electricity revenues, due to the high prices, also enhanced the value of the company, and therefore the profit to be gained from the sale of its capital. The French government was also a prisoner of its own consistency. By supporting market-based pricing and the partial privatization of EDF, it had thrown its lot in with liberalization, and had awakened new economic actors ready to invest in an opened electricity market. It would have been exceedingly difficult to reverse course.

But state actors did go as far as investigating the claims put forth by the large industrial electricity customers. At the beginning of 2004, the Economy and Finance Ministry asked the General Council of Mines and the General Finance Inspectorate to study the market's operation and thereby shed light on the debate. The two administrative bodies formed a committee that conducted a series of interviews, and collected economic data from a long list of stakeholders, including European actors. It set out to adjudicate the claims of the industrial consumers, compared to the arguments of the EDF, which claimed that the high prices were simply the result of the healthy functioning of a competitive market.

The Prévot (2004) report, named for its first author, presented a detailed rationale for the spot pricing model in the wholesale electricity markets, a model which

appeared to have the endorsement of nearly all economists. The explanation was based on micro-economic reasoning: a highly competitive market sets prices at the marginal cost of production. EDF used this "marginal electricity production cost" to justify the increase in market prices and the difference between market prices and production costs. The prices that the large French industrial consumers regarded as unjust were deemed to represent the normal and healthy functioning of the market. In accordance with this theory, in an integrated French-German electricity market, it was to be expected during times of relatively high load, that the wholesale spot price would be aligned with the costs of the most expensive installations used to meet marginal demand, namely, the German natural gas-fired turbines. But these prices were much higher than those the industrial customers had paid under the old regulated system, where prices were based on average costs. The industrial consumers also objected to the fact that a large part of the price they were now paying was not going to the expensive imported power from Germany, but to the nuclear industry itself as an windfall inframarginal rent.

Through a conservative and careful empirical analysis, the report confirmed the economic theory. The high prices could not be attributed to market power exercised by EDF, or collusion among large power producers. Rather, they approximated the predictions of economic theory, by which the costs of the marginal producer set the market price. The prices were not only the normal consequence of a competitive market, but were necessary for the market to function as an efficient allocation device. Without the high prices, the market would not be sending the correct price signals, and would therefore not provide an incentive for new investment in generation.

French academic economists joined the debate in 2007. David Spector (2007), a member of the Paris School of Economics concurred with the analysis of the Prévot

report. Dominique Finon and Jean-Michel Glachant (2007) , two other economists specialized in energy markets, did the same. All agreed that the high prices should be maintained, if not increased, in the future: the current market price reflected the scarcity of nuclear power plants. The high prices, and the resultant large profits for nuclear power, were the signal for new investments. Though well above the average costs of generating power, the prices were judged to represent an efficient price signal. The rents paid to owners of nuclear plants were not unjust; they were an appropriate price signal to encourage new entrants into the market. Economic expertise highlighted the specific case of the French market and made it possible to deconstruct the widely-held expectation on which all European policy was based: "the opening of markets to competition brings prices down." As Marcel Boiteux, a renowned French economist and CEO of EDF for many years, and identified personally with the establishment of France's nuclear patrimony described the situation, "it is no longer a question of opening up competition in order to reduce prices, as one might have initially believed, but of raising prices to allow competition. What a superb paradox…" (Boiteux, 2008).[2]

The Directorate General for Competition (known as DG Competition) admitted the possibility of elevated prices due to market concentration, but insisted that the remedy was further promotion of competition(Kroes, 2006). This is why at the end of 2005, the DG Competition decided to undertake an enquiry into the level of competition on the markets.[3] In the report (DG COMP, 2006), the DG Competition emphasized its

---

[2] Marcel Boiteux, « Qui empochera la rente nucléaire ? », La Tribune, 26 mai 2008.

[3] The inquiry and the reports have been conduct by London Economics and Global Energy Decisions and is titled Structure and Performance of Six European Whole-sale Electricity Markets in 2003, 2004 and 2005.

conviction that a structurally more open market would lead to virtuous behaviour by market players. More surprising still, from a French viewpoint, was the DG Competition's acceptance of a high electricity price level: it considered that a high price level was not necessarily a sign of market dysfunction and could have a positive effect on investment decisions. The main problem identified in the report was that a high price level in a highly concentrated market would not necessarily lead to investment given that producers could share out the income amongst themselves. Incumbent producers would prefer to maintain a condition of scarcity than to build more generating capacity. Persistent barriers to entry of new suppliers enhanced the ability of incumbents to benefit from scarce supplies. This is why the DG Competition again emphasized the need to move ahead with market liberalization so that competition operated in a satisfactory manner and focused on dismantling the vertical integration of the industry, separating generation from transmission and distribution of power. The market model itself and its redistributive effects were not discussed.

At the core of the ongoing dispute was a conflict between two modes of valuation. On one hand, the forces in favor of liberalization of the electricity market were compelling. These included the European Commission and its General Directorate for Competition, the French Ministry of Finance, EDF management, and a growing constituency of new and potential entrants, including their financial backers. For them the market promised the most efficient way of providing power. The price signals rendered by the market, moreover, provide the best guide to investment. It was also hoped that markets, if not locally, then globally, would realize new efficiencies at a time when the efficiencies of generating technologies had reached their limit. Within this frame, prices are evaluated according to their consistency with the aggregate functioning of the market. High prices, and high rents, could be justified if they were

accurate signals, if they represented faithfully the state of the market. Prices kept close to the production costs of power generators would be deemed unfair, since they would distort the signal, and perpetuate a shortage by not providing new investors with a "build" signal.

For French industry, particularly the electricity-intensive industries of aluminum, chemicals, steel, transport, and others, their relationship to the incumbent suppliers of electricity, particularly the "historic" nuclear plants owned by EDF, was not the impersonal link between buyers and sellers. According to this frame, EDF is an electric utility and also a national institution. Its mission is not necessarily to maximize returns for its investors, but to be a central component of industrial policy. Its provision of power at rates based on the production cost is the return on many years of state investment in the development of nuclear power. At a very material level, the very existence of the electricity-intensive sector in France depends on privileged access to state-owned power plants (Prevot, 2004)

In spite of all the criticism, the historical arrangement between State, EDF and electro-intensive has retained considerable legitimacy because it constitutes the material reality of the French nation's lighting, heating, transport, and everyday work. Market-based prices, with the potential, now realized, to rise well above the cost-based rates, violate the implicit terms of this postwar industrial order. In this inherited frame of nuclear and industry relations, the price should be limited, to the extent possible, to a just return on investments.

Solution I: working within the market

Via the Union of Energy-using Industries (Union des industries utilisatrices d'énergie or UNIDEN, accounting for 70% of the energy consumed by industry in France), the industrialists demanded that regulated prices be re-institutionalized. However, for the

French government, which was in the process of organizing the liberalization of the entire market, there was no question of going back to regulated prices. Nevertheless, the Minister of Industry, Francis Mer (himself a former manager from the electricity-intensive industry) was especially sensitive to what the electricity-intensive users were saying. While the government did not regard the grievance of the industrialists as warranting a reversal in its liberalization plans, it was willing to search for an accommodation. The arrangement had to be found within market institutions.

The Prévot committee recommended a market-based approach intended to hedge the industrialists' exposure to volatile and high prices. This would be a remedy for the grievances of the electricity-intensive industries, but which would not require a return to state-supervised regulation. Long-term prices would be negotiated. The committee drew inspiration from the Finnish European Pressurized Reactor (EPR) at Olkiluoto, financed by a purchasing consortium of electricity-consuming industrialists. The purchasing consortium signed long-term contracts that hedge these consumers against price volatility in the electricity market. Now the Prevot committee sought to transpose this approach to France, i.e. to set up a consortium that would sign a long-term contract with EDF. The consortium, named Exeltium, was the object of several discussions between UNIDEM and EDF and with the Ministry of Economy and Finance (including Energy and Industry). Nevertheless, throughout this negotiation, the prices offered to large energy consumers constantly varied, re-opening the controversy about nuclear power production costs, historical costs and future costs.

The search for institutional alternatives in France has to be placed in the context of European commitments: European directives about the energy sector and the Single Market rules. The French State could not reorganize the electric market without searching for legal validity from the European Commission. Indeed, the competition

authorities might accuse the French State of subsidizing its industrial activity via a favorable long-term contract. The simple fact that the State was a majority shareholder of EDF was bound to arouse the suspicions of the DG Competition. To justify the arrangement, it had to be proved that both the contract and the price remained "plausible," in other words, that it was in the interest of EDF to sign a long-term contract at a price below the market price, i.e., that the contract was genuine market behaviour rather than favouritism. For example, the lower price could be necessary to avoid the loss of electricity-intensive industrial activities at risk of being transferred abroad. Normally, the DG Competition should not have been able to oppose the drawing up of long-term contracts, identified as a means of encouraging investment, especially when the electricity sale price was supposed to cover the cost of building a new European Pressurized Reactor (EPR).

The DG Competition accepted all these arguments in favour of the long term contract. However, the DG Competition evaluated the Exeltium case in 'structuralist' terms, in terms of its consequence for the structure of the market. The degree of electricity sector concentration in France was extremely high and long-term contracts with a dominant supplier were likely to worsen this situation. The DG Competition used the structuralist argument to ask for a reduction in the volume to be distributed by the consortium. Thus the long-term contract was carefully designed in order to protect the industrial buyers from high prices, while remaining compatible with European requirements. It was presented as private arrangement between actors, making possible another price, more compatible with the previous historical arrangement.

But this conformity with market institutions seems to be more superficial than profound. This alternative was weakened with a multitude of contradictions, the most obvious of which was the following: trying to get the State to arbitrate while attempting

to show that the setup was conceivable without its support and thus consistent with the market. The EDF executives were reluctant to sign the agreement because it obliges EDF to sell its electricity below the market price, but still assume the investments risks. EDF management was concerned that the industrial customers would bolt the agreement as soon as market prices decreased. For their part, UNIDEN representatives publicly threatened EDF with State arbitration, undermining the case that EDF would contract with the consortium voluntarily, due to business interests, without being subject to political pressures.

Nonetheless, this arrangement remained plausible and acceptable within market institution. Even if the agreement was conducted by the State and could easily be defined as illegal State Aid, the DG Competition accepted it: cornered by its own contradictions, the DG Competition could not reproach EDF and French industrialists for an industrial agreement with a price guaranteed to provide a return on investment.

Solution II: a return to the regulated tariff

In 2005, while French industrialists were heavily involved in setting up the consortium Exeltium, it became clear that this approach would not provide the remedy they sought. Likely delays in setting up the consortium, while electricity prices continued to rise – doubling since 2003 – reinforced this conclusion. While Exeltium was being set up, various associations of industrial customers actively lobbied the French parliament in favor of a new regulated tariff. They were supported by members of parliament from different parties. Meanwhile, in 2005 and 2006, due to the increase in the market price,

EDF collected an inframarginal rent of 3 billion € each year[4]. The price had become a matter of public concern, and led to the mobilization of many French Parliamentarians, attempting to reconcile the situation with the European commitments to the development of an integrated European electricity market.

French Parliamentarians used a legal opportunity to seize the initiative. The parliament had been debating the possibility of restoring a regulated tariff to individual customers. This resulted in a new but temporary regulated tariff for large industrial and commercial customers: the Transitional Regulated Tariff for Market Adjustment or TarTAM (*tarif réglementé transitoire d'ajustement de marché*). They justified this tariff with reference to distortions in competition between industrial customers who had subscribed to market offers and those who had remained loyal to the historical supplier. The tariff defined within the framework of the TarTAM was 20 to 30% higher than the existing cost-based regulated tariff but remained much lower than the market price. In August 2008, France decided to extend this mechanism until June 30, 2010 and to open it up to new beneficiaries. The short-term effects of the TarTAM were as expected. It had a redistributive impact in favour of industrial consumers compared to what prices would have been under the market. In 2008, the redistributive effect was evaluated as 10 billion euros saved by industrial consumers, compared to what they would have spent at the market price. Also as expected, TarTAM reduced the rents received by EDF.

---

[4] Calculation from a comparison between average market price and official costs and the volume of industrial sector consumption. observations of the market made by Commission de Régulation de l'Energie

Unlike the Exeltium consortium setup, which the European Commission had been willing to accept, the setting up of a new tariff, the TarTAM, was bound to trigger a virulent response and worsen relations between the French State and the European Commission. From the point of view of DG Competition, the TarTAM consisted of re-introducing a regulated tariff. They regarded this as an extraordinary step, which should be reserved for situations of vulnerable individual consumers. Interpreted from within the frame of the competitive market, it constituted an instance of price discrimination, that could distort prices throughout the market. This initiative from the French Parliament represented a sharp break from the cautious strategy the Government had adopted until then, and which had led the UNIDEN and the Ministry of Industry to regularly consult the DG Competition and set up proposals that complied as much as possible with European law on competition. In 2007, DG Competition opened a formal investigation of aid supposedly granted to large and medium-sized enterprises in France in the form of an artificially low level of regulated industrial electricity tariffs, financed either directly or indirectly by the State. This procedure led to France's condemnation in 2009: the TarTAM was considered to be illegal State aid because it was selective, unfairly benefitting a single group of electricity consumers. It was anathema in terms of notions of market efficiency held by the market's protectors. More importantly, it would open up the market to potentially cascading political claims.

This solution to the spread between prices and costs is based on a direct political intervention in the definition of the value of electricity. The State stopped the delegation of the price mechanism to the market. This decision of the parliamentarians can be explained by the failure of the consortium Exeltium, a solution inside the market, to resolve the political crisis over electricity prices and the fate of the large electricity-consuming industries. The parliamentarians shared the concerns of the industrialists

about Exeltium, doubted the possibility of a remedy within the frame of the market, and tried to reopen a new space for alternatives to the market.

DG Competition's initial reaction to TarTAM was hostile. It considered the new tariff to be a 'retrenchment', and contrary to European Commitments. This political intervention was particularly egregious, as it affected both the setting of prices throughout the market, and the distribution of revenues. A return to a regulated tariff is not so much market design as a contradiction of the principles of European integrated markets: fair competition, free determination of price, economic efficiency. But the DG Competition is not only the defender of a liberal institutional order, it is also a political actor, searching for political legitimacy. It was also concerned that a high could be more problematic at a political level, since it could very well lead to the closing of large industrial enterprises in France. Thus its condemnation of the TarTAM was mostly formal and did not imply sanctions.

Solution III: Coexistence

In 2008 the Minister for the Economy and the Minister for the Environment formed the Champsaur Commission, which was charged with formulating a solution to the French market that benefitted the consumer, assured the competitiveness of the French economy, and guaranteed control over electricity prices, all 'while meeting European liberalization requirements.' The letter of assignment recognized that the expectations were contradictory but nonetheless expected the Champsaur Commission to set up a 'market design' that would reconcile them. The Commission's chair, Paul Champsaur, was the president of the French regulatory authority for the telecom industry. He drew prestige and a certain legitimacy from the acknowledged success in liberalizing French telecom market. The Commission included members of parliament and a range of experts, including an energy economist.

Until the work of the Champsaur Commission, the political demand for a stable price and the goal of a competitive market were seen as contradictory. The report, however, proposed and discussed two solutions. The first solution is one usually used to manage redistributive issue between economic actors. It consisted of setting up a tax on electricity produced by nuclear power while letting EDF sell freely on the market. The tax would be based on the nuclear rent, the difference between the price on the wholesale market and the average production cost for base consumption. This was a preferred solution for economists, since it would allow all wholesale prices to be determined by the market and would avoid possible market distortions introduced by price discrimination. The nuclear plants would be allowed to collect the "nuclear rent" but it would be taxed, with the tax revenues redistributed to various classes of power consumers.

The tax presented some tough technical problems, since it was to have a rate that was indexed to the market price of electricity. But the redistribution of the revenues to electricity consumers presented even thornier issues. The Champsaur Commission anticipated that it would have difficulty defending the tax before the European Commission, which would likely treat it as State Aid. The redistribution of the nuclear rent through a tax would be interpreted as a direct political intervention in the energy sector. By adopting the tax, France would be conceding the legitimacy of the market price, while drawing further regulatory scrutiny due to the new tax and subsidy. The Commission reasoned that it would be easier to take on the rules of the market itself, particularly at a moment when the market was increasingly suspect in the face of global political opinion.

The Champsaur Commission report expressed a clear preference for a reorganisation of the French electricity market by introducing 'regulated access to

production for base load consumption.' The principle of this system is that competing suppliers and large customers of EDF could obtain a part of their electricity through regulated access, at a regulated tariff, and the rest of the electricity it needed on the market. This system would be opened to French competitors as GDF-Suez or Direct Energie, or foreigners, as E.on or Enel. Such a system required defining precise criteria for determining the quantity of nuclear-generated electricity that EDF competitors would be entitled to. In the absence of such criteria, EDF's competitors would have an incentive to purchase large quantities at the regulated price, only to resell them at the market price. To determine the quantity of nuclear-generated electricity that EDF competitors would be entitled to, it was therefore decided that an 'objective, transparent and non-discriminatory' criterion be adopted: 'the consumption structure of the portfolio of customers residing in France.' It means that the volume of the electricity sold by EDF to each competitor at the regulated tariff would be limited to the base load required by this competitor for its French consumers. EDF's competitors would have to produce the remainder of the power supplied to their French customers themselves or purchase it at the market price. They would then sell their electricity to their clients at a price that reflected the weighted average of the tariff of the regulated access (baseload) and the wholesale market price (peak load). For industrial clients with stable consumption, the retai price would reflect only the regulated tariff. Thus the two institutional orders and two valuation regimes would coexist, with the capacity of the nuclear plants divided into regulated and market partitions.

The Champsaur Commission considered the existing base load to be an 'essential facility' in the same sense as the transmission and distribution network. This designation justifies allowing EDF's competitors to access the facilities of the historical monopoly. The concept of 'essential facility' defines the boundary between market and

regulated monopoly. Power generated by the essential facility is subject to the regulated tariff, while power produced outside that boundary is valued in terms of market price. To avoid the appearance of price discrimination within the marketplace, the commission recommended a severe criterion for reframing certain resources, a portion of the nuclear fleet, which would then be subject to a non-market pricing regime.

The main interlocutor to convince remained the European Commission. Nicolas Sarkozy formally asked Neelie Kroes, who heads the DG Competition, to abandon the condemnation of France in the Tartam case, and committed to implementing this new market model as soon as possible. In his letter dated September 15th 2009, Prime Minister Francois Fillon explained the precise technical arrangements that should regulate access for competing suppliers. The regulated sale of baseload electricity by EDF is presented as 'asymmetrical regulation of a dominant operator' to promote the entry of competition in the market. Considering that it is impossible for EDF competitor to enter the market, because of the TarTAM, which is lower than market price, and because EDF costs are lower than the cost of new competitors, it is necessary to introduce an regulation that helps competitor to enter the market, by giving them favourable rules. This asymmetric regulation has been used by the French Telecom industry regulator to help the development of the competitors of historical monopoly, France Telecom.

The DG Competition approved the Champsaur Commission's, thereby placing greater emphasis on its competition-enhancing features while tolerating its departure from the ideal of marginal-cost based pricing. In its reply of the 15th of September 2009, it recognized that the historic investments in nuclear power, with their low production costs, are difficult to integrate into the new market. And the DG Competition admitted for the first time that if the tariffs were abandoned, 'consumers would probably benefit

only to a limited extent from competition,' and conceded that the plan 'is likely to provide a major lever for competition.' Finally, it argued that the model could coexist with regulated competition, even while expressing some concerns over its technical complexity. This new organization of the French market was therefore a compromise formation, an attempt to accommodate the historic role of French nuclear power within the new European power market without weakening the latter. The two frames, two valuation regimes, of market-based pricing and a cost-based industrial compact, had reached a mutually-tolerable coexistence.

Conclusion

At the center of this narrative lies the *rente nucléaire*, a quantity of revenue received by France's national fleet of nuclear power plants, amounting to 3 billion euros annually during the years of high electricity prices in 2005 and 2006, and a potential revenue of more than 10 billion euros in 2007 and 2008 had the new regulated tariff TarTAM not been introduced. Viewed from the perspective of a set of relationships that comprise the late-20th century French industrial order, the nuclear rent is unjustifiable. Plants that exist for the purpose of the nation's industrial development cannot legitimately claim an entitlement to revenues well in excess of the costs of serving French industry. And industrialists, within this institutional order, can legitimately ask why they should pay these rents to nuclear plants that were established for their benefit. Their relationship to the nuclear fleet is not one of undifferentiated customers to a seller, mediated by impersonal market forces. They uphold a criterion of just prices based on the costs of their primary supplier, costs that they know very well due to many years of negotiating regulated prices. By attaching their grievance in the face of unexpectedly high electricity prices to this set of relationships, the industries make it everyone's grievance. As national industries, their economic viability is a public concern. And the

rents that the nuclear plants earn at the expense of these very industrialists are a public scandal.

But viewed from within the new institutional framework of the competitive electricity market, and its association with European integration, the *rente nucléaire*, or what economists refer to as an inframarginal rent, is not only just, but necessary. Moreover, it is self-correcting. As investors respond to the signal, capital moves into the vacuum of the nuclear sector. Nuclear, or other inexpensive baseload power eventually becomes abundant enough that the high-cost German natural gas turbines are no longer needed most of the time, and cheaper generators set the price for the system. But if the price signal is muted or otherwise distorted, and in the longer term brings the price back down. Here the criterion of justice is the efficient functioning of the market, the absence of collusion and the extent to which the price approximates the costs of the marginal supplier. Like the French industrial policy framework, the market is located in and supported by a configuration of actors and institutions, within which its legitimacy is established. It gains further support from its alignment with the goal of European integration.

Which of these is the correct interpretation, and whether the nuclear rent is damaging or benign, depends on the frame of reference one adopts. The struggle over the meaning and justice of the nuclear rent, and associated prices, is a struggle over which institutional order, which set of relations and identities, will prevail. The economic experts, nearly universal in their support for liberalization, derive their expertise from a network of relations with the main liberalizing agents (Eyal, 2013) From the perspective of French industrial relations, the postwar order of *planification*, industry and the power system are joined in an industrial policy (Dobbin, 1994).

The politics of electricity prices and the politics of institutional models of pricing mechanisms are continuous with one another. In an industry with prices that are subject to wide cyclical swings, criticizing the market is easier when prices are high. The political cycle of liberalization is tied to the economic cycle. As Borenstein and Bushnell (2014) observed in the case of the United States, the consent of powerful energy customers with the liberalization project is partly a function of prices. When market prices are low, consumers consent to liberalization and to their own transformation into calculating market actors. But when prices rise well above the costs of the traditional suppliers they are more apt to block the pro-market reforms, and to evaluate prices in terms of the production costs of electricity, and the moral universe of the regulated regime. This has been the case in France, where market prices exceeded the average costs of production, and industrial customers, with their allies in the government, reasserted the legacy of industrial relations that were still deeply embedded in the French economy. The relationship between prices and the framing competition is bi-directional: prices are allies in the competition over institutional orders, while institutional frameworks are allies in the struggle over prices.

Despite its nearly universal support from economic experts and regulatory bodies of France and the EU, and its consistency with the goals of European integration, the electricity market model has been strongly contested in the French case. In the eyes of industrial consumers, it has failed to fulfill its promise of reducing electricity rates. The contestation has caused a loss of legitimacy of the market model. Prices that may very well have been efficient within the market frame, reflecting a high marginal cost and a scarcity of lower cost generation, were nonetheless intolerable to actors whose existence, at least within France, was predicated on their access to low-cost power from France's nuclear fleet. Accordingly, the liberal reform of the electricity sector has

adopted a much more exploratory and uncertain path that had profoundly affected the credit attributed to the institutionalized market model. This weakening has led to a politicization of conception of markets, with several interventions by political authorities.

In opposing the liberalization, the large industrialists and their allies possessed a highly circumscribed repertoire of symbolic resources. They could not legitimately demand to be the beneficiaries of an arbitrary price discrimination. And although their objection was ultimately directed at the market model itself, they were unable to demand a wholesale return to the pre-market regulated regime. The set of powerful institutions, both at the national and European levels, in favor of opening the market, could not be resisted. Here the market and its negation were both necessary and inevitable. After an iterative process of exploratory politics, a simultaneous political inevitability and political failure of the market model, the French regulatory authorities developed a framework for the coexistence of market and regulated cost-based rates.

References

Boiteux, M. (2008, mai). Qui empochera la rente nucléaire ? *La Tribune*.

Breslau, D. (2011). What do Market Designers Do When They Design Markets? Economists as Consultants to the Redesign of Wholesale Electricity Markets in the U.S. In C. Camic, N. Gross, & M. Lamont (Eds.), *Social Knowledge in the Making* (pp. 379–403). Chicago: University of Chicago Press.

Callon, M. (1998). Introduction: The Embeddedness of Economic Markets in Economics. In M. Callon (Ed.), *The Laws of the Markets* (pp. 1–57). Oxford: Blackwell.

DG COMP. (2006). DG Competition report on energy sector enquiry, SEC (2006) 1724.

Dobbin, F. R. (1994). *Forging Industrial Policy: The United States, Britain, and France in the Railway Age*. New York: Cambridge University Press.

Eyal, G. (2013). For a Sociology of Expertise: The Social Origins of the Autism Epidemic. American Journal of Sociology, 118(4), 863–907.

Finon, D., & Glachant, J. M. (2007). La hausse inéluctable des prix de l'électricité en France : Faut-il corriger les effets du marché continental européen ?

Fligstein, N. (1996). Markets as politics: a political cultural approach to market institutions. *Am. Sociol. Rev., 61*, 656–673.

Garcia-Parpet, M.-F. (2007). The Social Construction of a Perfect Market: The Strawberry Auction at Fontaines-en-Sologne. In D. A. MacKenzie, F. Muniesa, & L. Siu (Eds.), *Do Economists Make Markets? On the Performativity of Economics* (pp. 20–53). Princeton, N.J.: Princeton University Press.

Geiger, S., Harrison, D., Kjellberg, H., & Mallard, A. (2014). Concerned Markets: Economic Ordering for Multiple Values. Edward Elgar Publishing.

Hirsh, R. F. (1999). *Power loss : the origins of deregulation and restructuring in the American electric utility system*. Cambridge, Mass.: MIT Press.

Joskow, P. L. (2003). Electricity Sector Restructuring And Competition: Lessons Learned.

Kroes, N. (2006). The need for a renewed European energy policy, OFGEM seminar on Powering the Energy Debate: Europe - Competition and Regulation London, SPEECH/06/541.

Prevot, H. (2004). Rapport d'enquête sur les prix de l'électricité. Inspection Générale des Finances, Conseil Général des Mines.

Reverdy, T. (2014). *La construction politique du prix de l'énergie. Sociologie d'une réforme libérale*. Paris: Presses de Sciences Po.

Schweppe, F. C., Caramanis, M. C., Tabors, R. D., & Bohn, R. E. (1988). *Spot pricing of electricity*. Boston: Kluwer Academic.

Schweppe, F. C., Tabors, R. D., Kirtley, J. L., Outhred, H. R., Pickel, F. H., & Cox, A. J. (1980). Homeostatic Utility Control. Power Apparatus and Systems, IEEE Transactions on, PAS-99(3)

Spector, D. (2007). Électricité : faut-il désespérer du marché ?

Vogel, S. K. (1996). *Freer markets, more rules : regulatory reform in advanced industrial countries*. Ithaca: Cornell University Press.

Zelner, B. A., Henisz, W. J., & Holburn, G. L. F. (2009). Contentious Implementation and Retrenchment in Neoliberal Policy Reform: The Global Electric Power Industry, 1989-2001. *Administrative Science Quarterly*, *54*(3), 379–412.

Figure 1. Price formation in the electricity market