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The Destabilisation of the French Electricity Supply Industry
Nascent competition in an open environment

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In February 2000 France, compelled by the 1996 European Directive 96/92, undertook a minimal reform of the organisation of its electricity industry, while preserving the boundaries of the incumbent company¹. The reform lays on the existing integrated structure a rule of third party access to the network, which allows bilateral direct sale arrangements on a limited segment, without any other notable changes of the industrial structure. In keeping with its original position at the beginning of the nineties, the French government has not wished to undermine an industrial organisation that it considers to be economically and socially efficient.

Is this structure, however, really all that stable? The theoretical model of network industry liberalisation considers that the introduction of limited rules of competition into a previously integrated industry triggers a process of destabilisation, towards a de-integrated and stable form (Gilbert et al, 1996). The change of rules provokes interest from potential entry candidates demanding developments that limit the advantage to the historical operator. In addition, it creates tension between competition-based logic and logic of the incumbent's dominant position. The dominant position of the historical operator shows in a number of barriers to entry: asymmetry of costs, manipulation of conditions of network access, cross-subsidies between different segments of the market, various commercial advantages (Armstrong et al, 1994). Some of these can be controlled by the regulator, but others cannot, and this discourages bilateral exchanges. As abuse of the dominant position is an ever-present threat, the regulator's incentive to adapt the rules and the structures is always there.

A second cause of instability is the asymmetry in structures and regulations between European countries. The French reform is being made in a regional economic space undergoing integration, in which the convergence of national regulations is considered to be essential for removing barriers to exchange. Even though the 1996 Directive does not lay down uniform rules, the level of difference of rules that it allows between countries is not definitive. The specific nature of the new French organisation has raised the level of institutional variety in the European Union and is creating significant levels of inconsistency between member states. The excessively dominant position of the French historical operator in the territory could bring about abuses that run contrary to the competition law and give rise to legal, political and economic disputes referring to the reciprocity principle at European level, all of these being a source of destabilisation. But even without such abuses, asymmetry in ownership regimes could exacerbate the controversy on rules and industrial structures whenever the public incumbent develops an aggressive strategy of acquisition in Europe, as recent EDF's direct or indirect takeovers in Germany, Spain and Italy have demonstrated.

The aim of this paper is to analyse the conditions of destabilisation of the industrial organisation of the French ESI, by identifying the economic factors of endogenous and exogenous erosion. Firstly, after setting out the main elements of the French reform, which is aimed at making the electricity market contestable, the effectiveness of the "contestability" of the French power market is discussed. Secondly in order to test the stability of the new institutional arrangements, an institutional prospect is developed, on the basis of economic factors of instability and resistance, to produce two contrasting scenarios :

- one in which the particularly French model is retained ("limited contestability" market scenario) ;

¹ The Power Act was definitively voted by the National Assembly on the 1st February 2000 with a one-year delay with the deadline imposed by the Directive. A lengthy series of decrees have been laid down by the Government afterwards, in order to make the law fully effective in 2000-2001.

- another in which there is movement towards a de-integrated competitive model (“contamination by competition” scenario).

Thirdly we conclude on the basis of recent elements - the mandated divestiture of 6000 MW by the incumbent and the creation of a marketplace on the autumn 2001- that the future would be a mix of these two trajectories which will come within in the progressive integration of the national markets in continental Europe.

1. The liberalisation of the French electricity industry : a limited contestability

The starting situation in France is the “public service” model in the form of an integrated public enterprise Electricité de France (EDF) which is supposed to supply electricity on the basis of the re-distributive principles of the so-called *service public* with price uniformity and to be the instrument of industrial and energy policies. This organisation covered 94% of the production and 96% of the distribution. It was from outside that the destabilisation came, with the neo-liberal paradigm of the European Commission. For the Commission, as is known, the abolition of exchange barriers and the putting together of an integrated European electricity market require the de-integration of the industrial structure and the setting up of competition between decentralised agents, which allow consumers access to suppliers or producers of their choice. However, under the influence activity of the French Government, the Directive 92/96 has let a large room of choices between market opening up options.

So the aim of the French legislator in the directive transcription was to find a difficult equilibrium between opposing principles :

- to accept the regulations relating to competition, but as little as possible, the aim being to maintain as far as possible public services principles, the capacity for State action in matters of energy policy, and the strategic resources of the historical operator in European and international competition by preserving its integration;
- to preserve the legitimacy of the sector integration inside the public electricity enterprise by guaranteeing fairness in competition, by the transparent rules of access and the presence of an autonomous and empowered regulator (Henry, 1997).

The implicit aim is to make contestable the French power market and to place the incumbent under the threat of entries in order to improve resource allocations for the sake of the consumers interest but also in order to help good technical and economic performance levels with the persistence of the historic operator for the collective interest².

² France has however had to accept that its 1994 counter-proposal, known as the “single buyer system” was totally revised in the negotiation. This proposition was aimed at maintaining the monopoly of supply by the historical operator and proposed the combined organisation of planning and long-term competition through a call for tender procedure (DGEMP, 1994). The single buyer provision in the Directive is only a complex rule of access to the grids which suppress the supply monopoly of the single buyer.

1.1. The limited changes in the industrial organisation

With regards to the competitive principles, the reform (Assemblée Nationale, 2000) is characterised by four principal traits :

- it removes the legal barriers to entry into production with a simple procedure of authorisation and sales to eligible consumers, as well as the barriers to import and export,
- it aims to separate transmission operation and dispatching from the historical operator's other activities in order to offer guarantees of transparent and fair access to the grid, but without organic separation through creation of a subsidiary,
- it creates an independent institution of regulation (the Commission de Régulation de l'Electricité), with real powers in transport tariff definition and control aimed at guaranteeing non-discrimination in access and limiting abuse of dominant position;
- it gives the possibility to the government, in the name of the general interest, to open calls for tender to develop new capacities in nuclear technology or renewables and to oblige the historic operator to buy-back their electricity at the bid price (art. 8 of the law); its overcost will be financed by a charge paid by all the competitors.

At the difference of several other European power reforms, the law allows restricted access to the network for French consumers, by defining the threshold of their eligibility at the high level laid down by the Directive, without the possibility of sites aggregation or consumers grouping. Unlike in other European countries, the 190 local distributors are only partly eligible, their freedom to purchase electricity being limited to the quantities taken by eligible consumers in their zone³.

Table 1 : Timing of extension of the eligible consumers segment

	Eligibility Threshold (GWh)	Market Share	Number of Eligible Sites
1999	40	22.2%	449
2000	16	30%	1300
2003	9	33.7%	2.213

With regard to access to the network, the following provisions have been introduced :

- EDF must create an entity for transmission system operation (Article 12-14), bringing together the operator of the high-voltage network and technical dispatch, with a separate budget and specific rules of confidentiality supposed to create a Chinese wall between it and its sales and production divisions (Article 16); the transmission system operator (named Réseau de Transport d'Electricité) has been created on June 2000 and since this date it has demonstrated an effective autonomy in its decisions ;

³ Restrictions on direct exchanges are laid down by two provisions, a minimum duration of 3 years on direct transactions, and the requirement to carry on trading activity on French electricity to be a producer in France and not to exceed a ratio of his own production. This means that only independent traders or brokers registered outside France are allowed to trade. Registering a trading subsidiary outside France is a way to get round this restrictions. They might be abolished at a later date for being contrary to Directive 96/92 or to the French Constitution.

- the EDF's distribution units and the local distributors must not create specific entities, but are subjected to strict rules of confidentiality between the network control units and marketing units ;
- the selected type of access for third parties is the regulated third party access (TPA), which therefore means that transmission and ancillary services prices must be published (Article 23) ;
- the historical operator is required to keep separate accounts for production, transportation, distribution and other activities, with transparency of rules of calculation (Article 25)⁴.

On one side, therefore, there was the political purpose to avoid a destabilisation by separating the transmission-dispatching activities through the creation of a neutral enterprise, and by creating an organised market. On the other side, however, there is a clear willingness to respect the rules of fairness in competition by ensuring simplicity of transactions and transparency of costs. This is what guided the choice of regulated TPA by the legislator, and the choice of a simple and uniform “postage stamp” by the new regulator in 2000, this choice being helped by the netting of the French network.

1.2. Restrictions on the contestability of the open electricity market

In an electricity industry, are transparent and fair rules relating to access to the incumbent network enough to guarantee the emergence of a competition that is still basically potential? It is known that for a market to be contestable, one has not only to remove the legal barriers to entry, but define the market in such a way that the incumbent and the entrants all compete under terms that are symmetric. The incumbent must not benefit from advantages that allow it to deter anyone or to develop strategies for responding to the threat by maintaining a price level lower than the equilibrium price (Baumol et al, 1982, p. 349-350). Disincentives to entry reduce potential competition.

The preservation of vertical and horizontal integration confers upon the historical operator a number of advantages in competition, shown in the theory, which also constitute endogenous barriers for potential entrants. EDF concentrated initially around 89% of the installed capacity with three potential competitors who were institutionally and contractually related to him: the Compagnie Nationale du Rhône (CNR), a common subsidiary of local communities (60%), EDF (17%) and public railways (17%) which mandated EDF to operate and sell its hydro production (14.5 TWh), the Société Nationale d'Electricité Thermique (SNET), a subsidiary of Charbonnages de France (81%) and EDF (19%), which produced 8.5 TWh by dispatchable coal plants. EDF concentrates also 96% of the distribution and the supply, and the Société hydroélectrique du Midi (SHEM), a subsidiary of the national railways company, which produces 2 TWh with 800 MW of hydro plants.

⁴ Without a clear and detailed demarcation of transmission costs, and particularly between the transmission system and supply divisions, there will be significant information asymmetry between the historical operator and the regulator in the field of tariffs for high-voltage and medium-voltage transportation and ancillary services.

Table 2 : Position of EDF's assets in the total French power production in 1999

	EDF		CNR and SNET		Other producers*	
	Capacity (GW)	Production (TWh)	Capacity (GW)	Production (TWh)	Capacity (GW)	Production (TWh)
Nuclear assets	63	375	-	-	-	-
Thermal assets	17.2	25	2.5 (SNET)	8.8 (SNET)	6.1	14.7
Hydro assets	23.3	54.1	2.9 (CNR)	14.9 (CNR)	2.0	7.5
TOTAL	102	454.1	5.4	23.	8.1	22.2

* SHEM-Railways (SNCF) in hydro production, small producers (mini-hydraulic, renewables) and self-producers (cogeneration, etc.).

Source: Ministère de l'Industrie, *Statistiques Gaz, Electricité, Charbon*, Edition 2000

- **The asymmetry of costs between incumbent and competitors**

EDF's dominant position on the French market is considerable, with a holding of around 90% of production capacity, most of it at low variable cost (hydro and nuclear) (see Table 2). In addition its equipment, although very capital-intensive, has mostly depreciated. Knowing that EDF's capacity for production is in surplus in relation to the French market and that some long-term export contracts signed before the Directive will come to their end before 2010, the historical operator has considerable capacity for responding to the threat of competition : this means that without divestment in production assets it is able to keep its market share on the eligible customers segment at a very high level: probably up to 95%. (At the mid of 2001, EDF has lost 8 TWh in outlets, i.e. around 5% of the market segment). Under the pressure of the entries threat, the operator has re-negotiated prices significantly below the former industrial tariffs (a 15 to 20% decrease).

- **Conditions of access to the network**

With a mature, well-netted network, the possible manipulation of access charges is not the main means of disincentive for a vertical electricity enterprise, as it is obliged to respect certain principles relating to the public display of accounts and to simple access tariff structures (postage stamp). The same does not apply when fixing the tariffs for imbalances and ancillary services (the cost of which is always difficult to assess precisely), the price for connections and in the matter of technical rules relating to network access. Moreover the absence of an imbalance market and more generally of a power exchange market, precludes the value determination of imbalance kWh on a trading basis for bilateral transactions. It submits the competitors to the discretionary valuations made by the historical operator. In 1999 and 2000, most of the canvassed EDF's clients have been incited to keep their contracts with it because of a pricing of imbalance several times lower than in the case of switching .

The definition of technical rules must compel the system operator to manage bilateral transactions and the EDF's internal transactions in the same way, without ambiguity. A general grid code has to be published in 2001. However, the fact that the system operator is not converted into a subsidiary will always arouse suspicion from candidates with regard to confidentiality of information relating to their transactions, and suspicion that there might be discrimination between competitors in the technical re-dispatching.

- **Cross-subsidies in production between market and non-market segments**

The regulator's action should prevent the cross-subsidies between eligible and ineligible clients, particularly in the allocation of production costs and general expenses which is a classical problem of incumbent's market power. But every doctrine to prevent it is fragile. The report preparing the regulatory principles (the so-called Champsaur report) considers that the best tariff principle on the non-eligible client segment is the reference to the long-run marginal cost of production (Champsaur, 2000). It points that the same principle could not be the price reference in negotiation with eligible clients. This principle is not workable, in a business logic of preservation of market shares, with the cost structure mentioned above with few variable costs. EDF's major supply contracts are under threat from opportunist sales contracts signed at a loss by foreign electricity enterprises with overcapacity as it is the case from German utilities in 1999 and 2000. If EDF manages to retain its major clients, who are looking for prices 10-20% lower than past tariffs, it must rationalise and lower its costs. But the efforts at productivity that it is currently making in the fields of production and transmission will not be sufficient to compensate such a drop in prices. Cross-subsidies will be necessary in production to recover costs through captive client tariffs. If this practice was indulged on a large scale, it would be noticeable in EDF's production division income.

However the doctrine of the competition authority can not consider such a case as an abuse of dominant position (Champsaur, 2000)⁵. At the less it could be politically unacceptable by the defenders of the public service model if the differences in price trends between the market and non-market segments are too large.

- **The other advantages of the incumbent**

Generally speaking an incumbent company has an information-related advantage with regard to the clientele of eligible consumers (possession of a commercial network and client file system, in-depth knowledge of needs for each segment of eligible clientele, etc); it benefits from its brand image, the confidence that it has instilled in its newly eligible clientele⁶, and the traditional disinclination of clients to change their supplier. The experiences of electricity liberalisation shows that distributors regularly receive contacts from clients canvassed by other suppliers, and most frequently respond by lowering their prices (only 5% of canvassing succeeded in the 100 kW-1 MW sector on the English market), which is clearly the EDF's clients case since 1999.

It also benefits from the transactional simplicity of bilateral relations, which are standardised without the presence of the third-party transporter. It offers jointly energy, power, transmission capacity all in one (even with separate invoicing), unlike direct client-producer contracts, which involve an additional transaction with the transporter for transmission, imbalance and ancillary services, the installation of sophisticated real-time meters, all of which of course involves additional transactional costs.

The local distributors are disinclined to search competitive wholesale supplies by the incumbent's threat to sell on their market segment.

Finally, in anticipation of reform, the incumbent increases barriers to entry by various strategic actions. In the case of EDF it actually did this before the 1999 reform, by setting up a privileged contractual relationship with the major consumers (the Emerald contract, which

⁵ One could consider that there is a clear case of predatory pricing when the price is under the variable costs.

⁶ For an analysis of the effect of such a reputation and confidence relationship on the efficiency of a competition, see Stigler (1961).

offered an advisory service, pledges of quality and a penalty clause), improving its service offer to other industrial consumers, and reducing its industrial tariffs by 14% in real terms between 1997 and 2000 (together with a drop in domestic rates) as opposed to 8% over the previous four years, to the detriment of its indebtedness⁷. In 1999 and 2000 all the contracts with the 400 customers eligible have been renegotiated with new services supply and significant by lower price (see above).

1.3. The present state of competition

The first year of regulator's activities (on the period 2000-2001) demonstrates an effective capacity to avoid capture and circumvent elements of EDF's market power in different ways : definition of very detailed accounting rules for the transmission and distribution activities, backing of the strong functional and financial independence of the TSO, promotion of the TSO's auction to purchase electricity in order to compensate transmission losses, promotion of an intraday imbalance market mechanism to escape the EDF's monopoly. But there are still important remaining elements in the incumbent's supply advantages, as just pointed out.

In terms of general competition, the main potential competitive forces are the foreign electricity companies. Potential competitors against EDF in France are few :

- The private industrial groups Suez, the indirect owner of Electrabel, and Vivendi: although widely present in 1999 in the electricity industry abroad, they are only marginally active in France in centralised production and distribution but are active in on-site production, energy services and multi-service supply; moreover the second group went out the electricity sector in 2000 and merged its energy service activities with EDF's ones in a joint venture Dalkia Energie.
- SNET and CNR and SHER that the government transforms slowly in independent producers. The first one (1.5% of the production) is being progressively sold to ENDESA, which has acquired 30% of the stock shares in 2000 with an option on the remaining CNR's shares. The CNR (3% of the production) is planned to be placed under the control of Electrabel (sales of 30% of its stock shares)⁸. The SHER which produces 2 TWh (800 MW), is planned to sell its production to a foreign utility for retailing in France.
- The few French enterprises familiar with self-production through large-scale cogeneration (Air Liquide, Rhône-Poulenc, etc) and the gas and oil enterprises that might look downstream integration (Gaz de France, TotalFinaElf).

⁷ EDF, which owed as much as 215.5 billion francs in 1988, has debts of 110 billion francs in 1999. It has reduced its debt by only 33 billion between 1997 and 2000, compared with 62 billion between 1993 and 1996.

⁸ In November 2000 the CNR's stock shares sale to Electrabel was opposed by trade unions. So by that date an agreement has been reached for the creation of a joint venture (Energie du Rhône) between CNR and Electrabel for the trading of the electricity produced by the CNR's hydro plants.

Table 3 : Structure of the French power industry after the reform in 2001

Producers and Importers	EDF-Production Division ; CNR, SNET, SNCF, foreign utilities (Electrabel, Endesa, RWE, E.On, HEW, Verbund, etc.) and traders (Enron, TXU)
Transmission system operator	Réseau de Transport d' Electricité (EDF)
Distribution	Distribution operators (EDF units, 170 municipalities*)
Retailers/suppliers	EDF-sales Division, 170 municipalities, independent suppliers: foreign traders (Enron, TXU,...) and producers

*4 % of the commercial and household supply

Among them only SNET and CNR are active for entering the bilateral contracts market⁹. For the other French competitors the “multi-services” offer (power, gas, telecommunications, water, waste management) that may be made to eligible clients does not, for the best placed amongst them, constitute sufficient opportunity to make use of scope economies, even though several exceptions can be seen. Entries in production on industrial or commercial sites by Air Liquide, Dalkia (Vivendi group), Elyo (Suez group), Gaz de France should exert competitive pressure on the EDF's centralised supply of electricity.

Competition from foreign sellers is the most active. The overcapacity of integrated enterprises in adjacent countries (Electrabel in Belgium; RWE, E.On, EnBW, HEW in Germany; Endesa in Spain) is a factor in the development of competition on the contracts market¹⁰. The action of major traders such as Enron or TXU-Europe in Western Europe, but also some less international ones as MVV Energie (Germany), Electricité de Laufenbourg (Switzerland), Eurowatt Tradind (Belgium) could bring some major eligible consumers into relations with outside supply. In addition, these major consumers, which are present in other countries and can compare the conditions of supplying, could look to be supplied directly by the party making the best tender in the context of a multi-site European contract including their French sites. Moreover the absence of permanent congestion on interconnexion capacities with large part of the European countries on the continental area (Germany, Belgium, Switzerland, Austria, Netherlands mainly) is easing the access for foreign producers in two ways: 1/ the absence of specific procedure of allocation of physical rights on interconnexions and 2/ on the longer run the next adoption of simple rules for tariffs for transit and cross-borders exchanges in the framework of the European coordination of TSOs' rule-making.

Table 4 : Ratios of interconnexions capacities on their peak demands on the continental market for selected countries(out of electric peninsulas)

Switzerland	Austria	Netherlands	Belgium	Germany	France
1,25	1,05	0,45	0,38	0,27	0,18

Source : ETSO, *Net Transfer capacities 2000-2001*.

So the foreign power enterprises have decided to enter into the contract market. The German ones extent in 1999 and 2000 their offer of low price contracts in France. But competition remains limited for different reasons.1/ The absence of marketplace limits the possibility of

⁹ On the end of 2000, SNET has two direct contracts.

¹⁰ EDF has take the control of EnBW, the third German utility, in 2000.

price discovery for imbalance service and electricity wholesale. 2/ The traders are also strongly constrained by the law to create relations with the foreign electricity markets and by the narrow field of opportunities to trade. 3/ EDF can answer by lasting price decrease given its low variable costs. It could also reply competitively to the demand made by major consumers in several countries, in order to make them an overall offer along the lines of the most favourable conditions. Because of this, the direct loss of market shares by EDF in France is limited to few dozens of annual contracts (around 70 industrial sites and 50 clients are concerned on mid-2001 which correspond to 7% of the eligible clients segment i.e. 9 TWh) , without this posing a real threat to the French enterprise¹¹.

If the effective competition is limited, the contestability on the market segment of the 1500 eligible consumers is quite effective. Indeed EDF reacts to the German competitors' price offer which, once deduced the transmission fees, is set under their avoided costs as they do on the industrial segment on their national market: between 1.5 and 2 euros/MWh. EDF's answer was a proposal of price decrease from an average level of 3.3 euros/MWh to 2.2 euros /MWh for the larger consumers. The average EDF's industrial price (eligible and non-eligible clients) included decreases in real terms in 2000 by around 10% more than the other regulated tariffs.

Table 5 : Evolution of electricity prices in France since 1997

(Index 100 in 1997)

	1998	1999	2000
Industry*	94.95	91.74	80.00
Small industry and commercial tariffs	94.95	91.81	89.04
Households tariffs	95.55	91.62	88.36

* Average industrial prices

Source: EDF, President's press release conference, March 2001

To sum up in conclusion, the principle of TPA applied to a vertically integrated organisation carries within itself a disincentive to enter. The application of the access rules under the strict control of the regulator rectifies some of these unfavourable aspects, but certainly not to a sufficient extent for establishing an effective competition because of the disincentive to entries. In this context, it remains to identify factors favouring the stability of the industrial organisation, and those contributing to its destabilisation.

2. Preserving the French exception, or converging towards the European competitive standard : two opposite scenarios of institutional development

In a closed system, the empirical hypothesis, according to which the introduction of minimal rules governing competition in a vertically integrated network industry leads to irreversible destabilisation, could not be verified in the future because of the attachment to the public

¹¹ On May 2001, contracts were signed with a foreign enterprise for 71 industrial sites : RWE, HEW (with sales of 1 TWh), E.ON, Endesa and Electrabel which claims to have fifteen contracts for sales of 1 TWh. Endesa and Electricité de Laufenbourg have the ambitions to reach respectively 0.5 and 1 TWh in 2001 (*Expansion*, n°638, February 2001).

service norm and energy independence objectives. The French electricity industry, however, does not operate in insolation. In a European environment where the competition model in the electricity industry is becoming general, the quasi-monopoly position occupied by the historical operator is conducive to institutional instability. It subjects EDF to the criticism of its European competitors, and subjects the French State to pressure from the European Commission and from other member states, even if the reciprocity rules laid down in Directive 96/92 are respected. The threat of a new directive which the Commission promotes since 2000 under its rules harmonisation mission (article 35) questions the French postulate of the non-necessity of harmonising the organisation of every national electricity industries. It requires a justification of the current industrial organisation with regard to the aims of the distance to effective competition if some direct obstacles to trade with the other countries remain¹².

The supranational powers are not however strong enough for the European Commission's neo-liberal principles to be imposed on the member states that do not adhere to them by mandating reforms of the whole industrial organisation and property regimes of each national industry (with changes in the horizontal or vertical integration and privatisation). European legislation itself, through the successive treaties and through jurisprudence, is developing and growing richer as the member states succeed in introducing other normative reference than the free trade reference, as it has been the case with new public service provisions introduced in 2001 in the recent Treaty modifications.

This is the reason why the story is not yet completely written. In this section we shed light on the conditions that would lead to two contrasting scenarios :

- a “French market with limited contestability” scenario ;
- a “contamination by competition” scenario.

2.1. “Limited contestability preservation” scenario

In this scenario, the differences in industrial organisation between the member states remain for the duration. France manages to preserve its particular features by demonstrating its ability to avoid competition discrimination, by being proactive in the suppression of direct barriers on cross-border trade (as it is the case in the so-called Florence process of European rules harmonisation) and by arguing that the European area is the pertinent field of effective competition. As the first purpose of the European Directive is to remove the barriers to exchanges of electricity between countries and to organise the integration of national electricity markets, it would not be necessary for the strength of competition to be high on a national market if the market is contestable, provided competition is effective on the European level where a large number of competitors of appreciable size can be found. This case can be reinforced by referring to the industrial restructuring in progress in European countries in order to adapt to the reforms in competition.

¹² Since 1999, the European Commission runs a forum of regulators, transmission system operators and stakeholders in order to harmonise and simplify the rules affecting directly the electricity trade. This harmonisation process, known as the Florence Process, may progressively affect the legitimacy of situations that differ significantly from the average one.

Foundations of the scenario : weak economic contestability, but efficient political contestability

In this scenario if the reformed electricity market is limitedly governed by the economic principle of contestability, the institutions will be in the political field through the constant threat of institutional questioning by the European Commission and by foreign competitors. Under the shadow of this threat, EDF and the regulator are encouraged to seek transparency of costs, to ensure that there is no discrimination, and to show that the typically French method of industrial organisation is effective through improvements in productivity and through reductions in prices in both segments of the market. This principle of “political contestability” will show itself in a permanent benchmarking: reference to other countries will show that French performance levels are good and that customers are satisfied, in order to counter the institutional threat.

- **Demonstrating economic efficiency as a foundation for French resistance**

In this scenario, the regulator’s work allows information asymmetry on the costs (costs of transmission according to different voltage levels and location, cost of ancillary services, metering and production costs) to be limited. The regulator is able to demonstrate that there is no cross-subsidies, whether through manipulation of access charges and associated services, or by the allocation of production costs between the eligible and ineligible client segments¹³. French prices fall equally in the eligible client segment as in the off-market segment. France is able to demonstrate both non-discrimination in the field of competition, and the efficiency of the integrated industrial organisation, despite the low level of economic contestability.

- **Circumventing the problems of reciprocity**

EDF’s advantages could encourage it to develop an aggressive sale strategy at European level, to the extent at which its previous export contracts expire between now and 2010 and its outlets in France decrease. The restrictions imposed by the reciprocity principle (Article 19 of Directive 96/92), which is now written into the national legislation of eight member states, will compel it in all cases to avoid sales to foreign distributors and to consumers of a kind ineligible in France. In addition, as the activity of independent supply and trading is very limited by French law, then EDF’s trading and sales may be prevented in those countries.

In this scenario, however, EDF will circumvent these difficulties by developing a strategy of European growth based more upon a penetration through acquisition of companies and of production assets than on commercial competition through sales of electricity produced in France. This has already been the case since 1995, in the context of an internationalisation strategy in which European countries represented a major target for the French historical operator: successful acquisition of a majority shareholding in Grøninge in Scandinavia in 1996, the indirect control of the Swiss producer and transporter ATEL in 1996 (together with the German enterprise RWE), the direct and indirect purchase of London Electric in 1998 and SWEB supply activities in 1999 in Great Britain, the acquisition in 2000-2001 of 34% shareholding of EnBW in Germany. EDF proposes also swaps on production capacities to producers in Spain and in Great Britain. By reducing the aggressiveness of its electricity sales, EDF can limit the problems of reciprocity that lead to legal disputes, and the motives of its

¹³ The expert group (Champsaur Commission), which has prepared the tariff definition of transmission services and of the electricity pricing on the eligible segments, gave recommendations in this direction (see Champsaur, 2000).

competitors in looking for a change of rules and structures in France in order to reduce its dominant position on the French market.

- **The possibility of giving institutional guarantees through marginal reforms**

In this scenario, the French electricity industry may develop in some directions without a fundamental questioning of the EDF's dominant position and the long-term coordination mechanisms :

- the promotion of the two minor independent producers SNET and CNR to be controlled by major foreign competitors could introduce some elements of effective competition and break the status quo with these ones ;
- the field of eligibility could be widened to include multi-site clients, and to include all medium-voltage consumers (the number of eligible consumers would then increase from 3,500 to 350,000 and the level of openness in the market from 33% to about 60%) without a major upheaval, as the absence of de-integration of the distribution is in itself a guarantee that the dominant position of EDF downstream will continue; in this logic, the government could extend the eligibility limit to 9 GWh without waiting 2003 ;
- the transmission system operator could be organically separated from EDF by being converted into a subsidiary, and even by the creation of an independent enterprise, without bringing the EDF's dominant position into question, as it could be rapidly imposed by the next directive in project probably without opposition from the French government on this point.

The limits of the conservative scenario in the context of European integration

Are the economic benefits of the “political contestability” for the French customers a sufficient argument to preserve the French exception? Defending the integrated organisation in the name of the emerging competition between major European electricity enterprises contains contradictions, which are the sources of conflict in the future for two reasons: the size of the differences between structures and property regimes, and the progressive creation of organised markets in the neighbour countries.

- **Differences between structures and property regimes**

The French position implies that major differences must be acknowledged between the new enterprises pieces of former incumbent submitted to mandatory divestiture or de-integration and subjected to competition on their national basis on one hand, and historical operators whose vertical integration is preserved and which can rely on a huge captive market on the other hand. Apart from Electrabel and the two German majors which are integrated in transmission and partly in distribution, the French electricity enterprise would be the only one to preserve all of its vertical and horizontal integration in production and in distribution-supply at a large scale.

In competition on the national and foreign markets, the integrated operators have an advantage over the smaller enterprises and those specialised ones in production to gain shares

in the market there¹⁴. This advantage is reinforced when the company has a quasi-monopoly on his national market, what is not the case of the German or Spanish majors which endure competition from other national electricity enterprises in their country. Moreover their size also gives them larger means for the purchase of shares or of enterprises¹⁵. In the same time the public property and the absence of divestiture program restrain the opportunities for acquisitions on the French sector. The principle of reciprocity written into the different national legislations only allows the direct effects of the legal differences between rules and structures to be mitigated in part.

Even if eventually, the principal element of their European strategy, as EDF's one, is not made up of sales outside their national territory, enterprises that remain integrated such as EDF will be subject to legal attack from their competitors on this level. EDF's strategy is mainly conflictual because of the asymmetry of the property regimes and the impossibility for foreign companies to acquire production and distribution assets or companies. Hostile governmental reactions on indirect acquisition in Spain of Hidrocantabrico via EnBW and in Italy of Edison, via Fiat's and EDF's common takeover on Montedison in spring 2001, suggest strongly this limit¹⁶. Pressure are exerted not only on property regimes but also on industrial structures and market-rule¹⁷. This gives some new political justification to the rules harmonisation process. Moreover EDF's expansion strategy gives some room to the European Commission to impose some structural changes in France. So the EDF's partial takeover on EnBW in 2000-2001 has had to be negotiated with the European Commission which obliged it in February 2001 to sell 6000 MW of capacity in France, which has been realised on the autumn 2001 in a virtual way by selling 250 MW blocks in multi-auction rounds.

- **Destabilisation by new market institutions**

The very nature of the competition that develops in a country must necessarily be influenced by the type of industrial structures and the market institutions in existence in other countries. Liberalisation will give rise to new transactional needs and introduce a greater level of fluidity between national markets. In order to get out of the marginal role limited to a restricted number of bilateral contracts, competition between several countries necessitates the creation of organised markets (pool, power exchanges).

Even if, with a practically unchanged vertical integration between production and distribution supply as in Germany, Spain, France and Belgium, the competition around bilateral electricity transactions in this area will be of secondary importance outside the segment of major consumers, it is sufficient to justify the creation of an electricity exchanges market. Spain has a power exchange since 1998, the Netherlands since May 1999, and Germany two electricity bourses in Frankfurt and Leipzig since mid-2000. In France the existence of these markets is

¹⁴ We are already thus seeing EDF and Scottish Power, both integrated enterprises with overcapacity and benefiting from a favourable cost structure, selling without problems on the Anglo-Welsh pool within the limits of capacity restrictions on interconnexion lines.

¹⁵ In 1998 and 1999 EDF has thus, because of its financial weight, easily been able to increase its purchase offers for two distribution companies in Great Britain, to the detriment of smaller private enterprises, particularly British Energy. It can also buy, for 17 billion francs, a third of the capital of Germany's third largest energy company, EnBW.

¹⁶ For a following-up of the controversies, see the successive issues of *Power in Europe* (Financial Times) between March 2001 and June 2001.

¹⁷ Another revealing example of this: in 1999, when EDF placed sale contracts in Great Britain because of its new installations in "supply", and demanded to "trade" in Spain, electricity companies in several countries complained about it to the European Commission. See *Financial Times*, July 23, 1999.

encouraging protagonists other than EDF, i.e. the regulation commission, the transmission system operator (RTE), entrants (Electrabel, traders), industrial consumers, to request the creation of such a power exchange with three motivations: the non-discriminatory supply of imbalance services, the TSO's purchases of electricity for the transmission losses and the price discovery for helping bilateral transactions (CRE, 2000 and 2001). On the other hand, as EDF wants to sell or buy on the foreign markets and use the marketplaces, it cannot be opposed to the creation of such a market device, even if the future game could reveal its market power. In fact such a development would risk to reveal critical problems linked to the EDF's dominant position. It could in fact compel French regulator to ask question on the price discovery process, and foreign competitors and governments to question differences in structure (number and size of producers and distributors, size of trading activity, respective liquidity of markets).

However that may be, this scenario of institutional stability may occur despite its limitations. The internal consensus in France has been cemented by the attachment to the public service model and to its capacity for leading policies of preserving energy independence as well as the strong tradition of promoting a national champion in the context of world competition. The European Commission have not power to impose a reform of the British kind. The next directive to be decided in 2001-2002 will impose rules that give more transparency to trade by the complete separation of the Transmission System Operators, the prescription of the regulated TPA and a new extension of the eligibility, but without questioning the other sources of market power. In future, France will be able to make use of its model's capacity for efficiency while serving as a support for the pursuit of the general interest, justification of which may be consistent with European legislation.

2.2. The “contamination of competition” scenario

In this scenario, the pressure to make the forms of industrial organisation present in the European Union converge towards a common model is gaining the upper hand. Structural developments (level of openness, vertical separation, divesture in production, creation of power exchanges, etc) occur more quickly than planned in other countries and are making the French model increasingly isolated. The French State is being obliged to change its advocacy of its “national champion” policy and look to set up means for effective competition. Aiming to escape the capture by the incumbent and the administration as it has experimented the difficulties to control the EDF's dominant position effects¹⁸, the regulator chooses to promote effective competition. But now far could the government accept to sacrifice its capacity of action in energy policy?

The process of destabilising the integrated industrial organisation

The difference of structures between countries and the weakness of effective competition in France will have a strong effect of destabilisation in this scenario. Increasing pressure will be exerted by the European Commission and other member states on the French government because of the strategic advantages that EDF derives from its quasi-monopoly and from its

¹⁸ The experience of the Telecommunications Regulatory Authority in France shows that such a case is capable of resisting capture by the historical operator, but in a context much more competition-intensive than that of the French electricity market. The Electricity Regulation Commission will not benefit (one might say) from this situation. It will therefore be encouraged to suggest new regulations for resisting capture.

property regime which exacerbates foreign competitors' and governments' opposition. But the change of paradigm inside France could participate in the dilution of the public service model; the EDF's commercial strategy, its logic of profitability in its international activities and its heavy presence on liberalised markets rob it of its originality, making it appear as a mere industrial enterprise with some minimal public service obligation, and thus weakening its exceptional status and lessening the cohesion of its "technostructure".

- **Stages of destabilisation**

The total separation of the system operator after the next directive and the 6000 MW-divestiture mandated in 2001 by the European Commission will have a first impact on the effectiveness of the internal competition in the next future. But competition will still remain affected by the size and the structure of the remaining EDF's equipment portfolio (around 95,000 MW with 90% of hydro and nuclear capacity)¹⁹.

The destabilising process may be triggered by the creation of a day-ahead spot market. The definition of the power exchange will be influenced the experience of the other countries. The abandonment of the compulsory pool for a decentralised design in the UK or the efficient records of the decentralised Nordic market should lead to the adoption of a voluntary market. This type of design presents another advantage, to be more acceptable by the historical operator or its main inheritor which would not have to sell all its production on the organised market.

Foreign producers and French independents would participate with EDF in this market. In this initial configuration, EDF would not be compelled to advertise its available output. Prices would not be aligned to its short term marginal costs, which would be low on the major part of the year (euro 1.5 /MWh). Low market liquidity could raise questions. In a second step, the French and foreign producers, suppliers and traders, by understanding the great potential of low-price offering of EDF's production system, would look to participate and purchase more and more on the French power exchange. This market could rapidly assume the function of a clearing market between Continental European producers with different variable costs. Faced with the reluctance of the French operator to play the market by refusing to offer its available output at the short-term marginal cost, the Competition Authority and the electricity regulator would then be encouraged to oblige EDF to advertise its full available capacity output. The next stage would be the internal questioning of EDF's dominant position in France given the small number of direct bilateral transactions compared with high exportation levels. It would lead to a divestiture of some of its production and distribution assets at the request of the government and the regulator.

The present evolution seems to follow the first stage of this scenario. Under the auspice of the Paris stock exchange and with the regulator's encouragement (Carmona and de Fouchécour, 2000), a voluntary day-ahead market, named PowerNext, and an imbalance market mechanism are being created before the end of 2001. Beside Euronext, French, Belgium and Dutch TSOs, Electrabel, EDF, TotalFinaElf and two banks participate in the organisation of the power exchange and in the market operator company. The marketplace will be opened to traders and foreign companies. It will be extended to Belgium wholesale markets in 2002.

¹⁹ The 6000 MW capacity have been sold in autumn 2001 as "virtual capacity" by different tenders for mid-term production contracts from identified units. Those ones include a nuclear unit, some peak units and some coal thermal plants.

- **Reform towards a decentralised industrial organisation**

Adhering to the competition paradigm would lead to changes in public property and to the definition of a new industrial organisation scheme based on the lessons learnt from foreign experiences and the debates relating to them (Joskow, 1996; Finon, 1997, Newbery, 1998). Without an integration of short-term markets on the Continental Europe which could reduce the effects of dominant position on the national markets, the issue of the number of producers of significant size would be raised because foreign competitors' direct sales on the French power exchange will be marginal. In this respect the distribution of incumbent's various types of equipment between competitors is a parameter that must not be neglected, in view of the differences in cost structures and the opportunities for significant income from equipment of low variable cost (Green & Newbery, 1992). So one would look to disperse production assets between four or five producers with a portfolio of assets of similar structure, each including nuclear equipment and hydro plants, and entry by independent producers would be encouraged, as the last IEA's assessment report on the French energy policy recommends (IEA, 2000).

Downstream the aim would be to reach several dozen purchasers (regional or local distributors, intermediaries) on the wholesale market, that would be helped by dispersing some of the distribution assets²⁰.

- **Institutional possibility to preserve nuclear re-investment**

The de-integration of the French electricity industry would not remove all the long-term co-ordinations that were previously provided by the historical operator by virtue of its national monopoly. The capacity for action by the State in terms of pursuing collective goods (energy security and environment), via the programming procedures set in the new Electricity Act, may also be preserved, even though it may not be able to fulfil its planning activity as readily as before²¹. Even in this liberalised context, the French State would have means of command and control for directing technical choices and preserving the nuclear option. However it will weaken the institutional path-dependency. The institutional bodies that authorised the successful development and operation of nuclear equipment would be weakened by the setting up of an effective competition involving the dispersion and privatisation of a major portion of the nuclear assets. The political support should be very large to have a new resolute industrial program. But the overcapacity and the possibility of increasing the lifetime of nuclear equipment remove this issue after 2015, at a moment where the new industrial organisation property regime will be largely set up and stabilised.

²⁰ The French-style concession regime gives the local communities legal ownership of the networks, the value of whose assets does not appear in the fixed assets totals on EDF's balance sheet. A possible scheme would be to leave the non-nationalised distributors by selling them the adjacent local networks up to 15-20% of the distribution market that would escape the integrated operator, as will be the case in Italy. In all cases, the compensation would be payable to EDF, which has invested in and financed the development of distribution.

²¹ These institutional devices include an indicative planning procedure and bring the projects of both public and private actors face to face with foreseeable demand and targets of preservation of collective goods. They also give the government the opportunity of opening a call for tenders for setting up a given capacity of equipment, based on specific technology, if foreseeable developments in respect of this equipment conflicts with energy policy objectives (Articles 6 & 7 of the law of 1999). Production from this equipment would subsequently benefit from a forced purchase by the major distributors, at the initial price offered by their promoters, in the context of a long-term contract, thus circumventing the rule relating to compulsory sale to the pool.

The scenario limitations: the double difficulty, economic and political, of dispersing nuclear assets

Even if a change in the public opinion did allow the nuclear assets to be divested, their value would be difficult to assess and their privatisation could be hindered. The financial community or the industrial candidates for repurchase have misgivings about an economic risk that is difficult to define, as the problems of privatising British Energy's nuclear power stations in 1995-1996 and those of Ontario Hydro in 1998 have shown (Mackerron, 1996). However more recent developments in nuclear divestures in 1999-2000 by the US utilities with the asset price established over the book value show that confidence could eventually be established for sales of equipment acknowledged as efficient.

Moreover political acceptability of nuclear stations privatisation is not guaranteed. The presence of some sixty reactors whose operation is subject to rigorous safety requirements and seasonal coordination for maintenance and reloading of fuel is not favourable to the idea of dispersing a fleet of nuclear reactors amongst several private and public producers all in competition. No party to the past and present French debates put forward the idea of a de-integrated competition-based scheme between several operators. In the same logic the solution adopted in 2001 by EDF and the government to answer to the prescription of the Commission to divest 6000 MW for the clearing of the EDF's acquisition of EnBW stock shares avoids the issue of divesting directly nuclear plants. It is a virtual divesture with multi-round auction for sales of 250-MW blocks on a limited contractual period with no relation to a particular plant.

In the future the allocation of all nuclear assets to a public or a semi-public producer would be a solution adapted to meet national sensitivity. However it would create an irreducible dominant position situation on the electricity market for private competitors inheriting hydroelectric and conventional assets. An intermediate solution would be to concentrate ownership and operation between two producers, one public and the other private, beside several private competitors inheriting hydro and conventional assets. The former ones would be reckoned to be in competition, while at the same time bearing pressure from the latter ones who would benefit from the hydroelectric rent. This type of structure would be better suited to the carrying on of effective competition. However, the risk of tacit agreement within the nuclear duopoly on the power exchange market would be significant. Other divestures of assets would doubtless be necessary in order to arrive, through combining equipment, at an industrial structure that would be satisfactory from the competition point of view.

So the search for an efficient use of the nuclear assets, and the willingness to preserve the conditions under which they could be replaced, may lead to retain the former structures. Even if the range of electricity technology available is increasing to include techniques that are much less demanding in terms of institutional protection, justification could remain legitimate by evoking gas dependence risk that could result from the large-scale development of power generation by gas.

3. As a conclusion : The narrow crest line

After two years of liberalisation the present landscape in the French electricity supply industry is one of increasingly effective contestability but with still limited competitive forces.

- The regulatory authority which is endowed with real powers of control on network access enforces the credibility of access rules and non-discrimination and promotes non-distance related transport tariffs for helping transactions.
- Property rights on the incumbent's transmission system and its operation are radically weakened (but with some residual difficulties on the medium voltage distribution), that will facilitate the TSO's legal independence in the near future. Imbalance service supply is becoming market-based for escaping to the incumbent's monopoly.
- The introduction of a market institution such as a power exchange at the end of 2001 will allow a price discovery process helping bilateral transactions and entries.
- The incumbent's dominance on the wholesale market is eroded by the legal separation of two IPPs from it and the virtual divestiture of 6000 MW representing one third of the eligible customers' power demand.

Table 6 . Entries with tradable volumes on the French wholesale market in 2002

	Volume (TWh)	Notes
Competition field	• Eligible consumers Market	120 • 16 GWh eligibility treshold • 29 % of the market • 110 switching sites in 2001
	• RTE auctions for supplying losses	10 (7 suppliers on the first half of 2001)
	Total	130
Types of primary volumes	SNET potential	4 Part of SNET's production (5TWh) is engaged in ppa with EDF
	CNR potential	15 Commercialisation by Electrabel and CNR's joint ventures
	SNCF-SHEM potential	0,5-2
	EdF auctions	15-22 2400-3600 MW the MW VPPs, out risk of purchase for resale on foreign markets
	Foreign producers	8,5-20 Level of sales in 2001 : 10 TWh (HEW, Electrabel, E.On, RWE, Electricité de Laufenbourg, etc.)
	Total	43-63

The entries of five foreign producers in 2000 and their impact on the 15-20 % price decrease for industrial eligible customers are the signature of an effective contestability on this market segment, even if only 7% of it have escaped from the EDF supply. The future competitive purchase of 250 MW-blocks in the auctions of autumn 2001 will very probably give a new impetus to the competition. However the process of auctioning, the Virtual Power Plant (VPPs) auctions is staged in several steps of 1200 MW between September 2001 and 2003 in order to avoid a destabilising shock on the short term market. The selling price will be probably quite low after the second step of 2400 MW in 2002²² in the context of remaining overcapacity in France, Germany and Belgium. Moreover the power exchange creation on the same period will ease the trade of electricity quantity concerned by this virtual divesture.

So the French electricity supply industry is clearly engaged on a narrow crest line between the "limited contestability" and "competition contamination" scenarios, the main differences of which are the preservation or not of the public property, the incumbent's horizontal integration and the centralisation of the nuclear assets ownership for maintaining good operating performances, safety records and the capability to re-invest in this equipment. The prospect exercise shows that in the future the main differentiation factors at the cross-roads between institutional trajectories will be : 1/ the intensiveness of European external pressures because French market-rules, industrial structures and property regimes are too different from that of the other European industries together with which it is reckoned to make up an integrated market, and 2/ the own destabilisation effects of introducing market-rules and institutions such as a power exchange revealing EDF's excessive market power in a context of consolidation of an independent regulatory control.

In the European environment, the government and the regulator try to improve the conditions of market contestability by copying some foreign solutions as the creation of a power exchange or imbalance mechanism and the complete functional separation of the French transmission system operator. Moreover the influence of the European environment is clearly demonstrated by the virtual 6000 MW divesture imposed on the EDF's production capacity, which will be an element of activation of the competition since the end of 2001. Exception in property regime is also increasingly pointed out as a constraint for the European integration in capital stock exchange between electricity companies. In the same logic the new directive in project to be voted in 2002 or 2003 (European Commission, 2001) which aims at rules harmonisation will facilitate the adaptation of rules and industrial structures in the direction wished by the French regulatory authority.

Finally the influence of the German market on the French one in the present context of overcapacity is indicative of the potentialities of integration of some of the national electricity markets on the continental Europe in the future. The journey is probably long towards a short term markets integration in the regional area where interconnexion capacity between countries is large and internal congestions limited in locations and in time given the maturity of networks. This integration will imply obliteration of the legacy of long-term imports contracts, narrow technical coordination between TSOs, efficient and homogenous market rules on the transmission and interconnexions access, harmonise rules between marketplaces and imbalance devices and ease price arbitrages. Some progress already has been made in this direction. Will the degree of integration which could be reached in the mid-run be sufficient to avoid new questioning of the French incumbent's excessive dominant position in its home-market ?

²² The first step of 1200 MW auction in September 2001 has given disappointing results, the selling price being higher of the wholesale price to large consumers (Euro 20/MWh) (Power in Europe, 360, 24 sept. 2001).

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