

Concentration in the European electricity industry: The internal market as solution?

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Abstract

This article offers an analysis of the present competitive and regulatory framework of the European electricity sector and the results achieved with the liberalisation process. Considering the reactions of incumbents to the liberalisation, the focus in this work is mainly on the problem of market concentration in the sector. The new trends toward the creation of “national champions” as well as recent mergers between gas suppliers and electricity producers raise serious concerns about abuses of market power and risk of future collusion. In particular, the strategic linkage of existing markets and the expansion into new ones are analyzed in the light of the multimarket contact theory. Considering investment in interconnection among Member States, the internal market issue is investigated as a solution to the “risks” coming from liberalisation.

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1. Introduction

The European single market programme launched in 1987 aimed at Member States removal of any physical, legal and fiscal obstacles in order to obtain the free movement of goods, services, capitals and labor in the European Union (EU). The Single Europe Act required, among other things, the abolishment of state-owned monopolies. These changes applied also to the electricity sector.

In the 1990s the electricity sector was still a heavily regulated industry in almost all EU Member States, dominated by national or regional, vertically integrated monopolies engaged in generation, transport and retail. In other words, they represented the main actors from production through distribution to the final consumers.

Moreover, these monopolies were often state owned companies.

In general, transmission and distribution are characterised by high capital intensive segments, where substantial investments are required to maintain and to build network infrastructures and power plants, necessary to meet electricity needs of consumers. Furthermore, due to long investment periods, continuous planning and monitoring are indispensable.

Two reasons in particular, namely the security of supply and the complexity of this commodity justified the intervention of the State. Indeed the electricity sector is considered extremely important for the economic development for all other sectors. Moreover, the particular characteristics of electricity, such as non-storability and the continuous balance between demand and supply, supported the State intervention. This situation led the lack of economic incentives towards efficiency, where State subsidies have been the rule to maintain a stable industry.

Several problems, such as overcapacity of generators, did not foster competition resulting also in lack of incentives towards innovation. Furthermore, the choice

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of the type of energy source, used in the electricity production process, came from internal resources, in consideration of the security of supply and not of the cheapest resource available (Serralles, 2006). This situation led also to insufficient diversification in terms of fuel sources, which is now recognised as an important strategy in the internal market.

Considering all these characteristics, the transition from highly regulated state-owned integrated monopoly to a situation of free competition poses problems of different nature. For example, the reaction of big generator incumbents to the liberalisation process has been an increasing trend toward vertical and horizontal concentration. What the effect will be of this new scenario is an open debate. Moreover, issues arise on what the outcome of the liberalisation process will be in term of the necessary investments, to maintain the infrastructure and to build new capacity. Furthermore, important investments are also needed in order to create the necessary interconnection among the different Member States and hence to increase competition among different, mainly national electricity wholesale markets. This lack of interconnection capacity is one of the main obstacles in achieving the internal market. Another more general question is whether the liberalisation process will give the right incentives toward the sustainable development of the electricity industry in the long run. Will some external intervention be needed? To some of these issues this paper will try to give an answer.

The paper is structured as follows. In the first part, the European regulatory framework and its achievements are analyzed. Subsequently, the trend of generators toward horizontal and vertical integration across Europe is studied. Having underlined the possible anticompetitive effects of concentration, a better implementation of the internal market — enhancing investments in interconnection — is investigated as one of the main solutions to present and future risks for the condition of competition in Europe. The last section concludes.

2. The results achieved by the European regulatory framework

There are three essential goals pursued by the European energy policy. First, the creation of an internal market as a means to introduce cross-country competition and thereby set the right incentives towards efficiency. Efficiency gains are expected to be passed through to final consumers in the form of lower prices. The second objective is to guarantee security of supply. The last goal is the enhancement of environmental protection.

All these goals are not completely separated from each other, but they are complementary in achieving different but connected objectives. For example, as discussed below, the creation of the internal market is also one of the best ways to meet the security of supply objective.

2.1. The goal of liberalisation and its problems

The first legislative framework leading toward liberalisation was established with the Directive 96/92/EC.² Nevertheless this directive did not reach the expected results. The negotiated Third Party Access, the limited effect of accounting unbundling duty and the lack of obligation to create national electricity regulators did not foster the achievement of competitive markets. Another market distortion resulted from the different results achieved by each Member State in opening the electricity market to competition (European Commission, 2007).

For all these reasons, the European Commission decided to implement a second step in order to accelerate the liberalisation process and to correct the limitation of the first directive. In 2003 other two measures were implemented: the second electricity Directive 2003/54/EC³ and the Regulation 1228/2003/EC regarding the regulation of cross-border trade.

The Directive also contains some limitations in reaching the predetermined goals. In fact, it did not eliminate the difference among Member States concerning the market design obtained. Moreover, different Member States have not implemented this second directive in a sufficient way. As we will see, this situation shows some difficulties in creating a competitive environment.

As mentioned above, the “second electricity package” includes also the Regulation 1228/2003/EC regarding the cross-border trade of electricity.⁴ Since the interconnection

²Different goals have been pursued by this legislation. First of all, the directive distinguishes the regulated segments of the industry (transmission and distribution networks infrastructure) from the competitive segments (generation and supply or retail). Moreover, the directive has prescribed the gradual electricity market opening, establishing different rules concerning the non-discriminating access to the transmission and system network, leaving to Member States the choice between the third-party access (regulated or negotiated) and the single-buyer model. It has established requirements for national dispute settlements indicating also two options for the construction of new generation plants (a tender procedure and an authorisation procedure). It has required the unbundling of the transmission system operators (TSOs) and the accounting separation of both transmission and distribution from other market actors.

³The new Directive has four main key objectives. First, it guarantees a better nondiscriminatory access to the network, eliminating the possibility of negotiated third party access and allowing only the regulated TPA, assuring to all market operators a better right to access the network without discrimination. Second, it has assured a more effective legal separation between market actors and the operators working in the transmission and distribution, with the aim of limiting the risk of cross-subsidisation and discrimination between incumbents and new entrants. Third, it has established the obligation for the Member States to create an effective regulator with a major degree of independence from market operators but, as we will see later, not from national governments. Fourth, the Directive contains a timetable for the different market opening stages, where consumers have the freedom of choice of suppliers, 1st July 2004 for the nonhousehold users (industrial, commercial and professional costumers) and 1st July 2007 for all consumers.

⁴In particular it regulates main features such as harmonised principles for tariff and payments between TSOs as well as rules and compulsory guidelines regarding the congestion management of the network and the

capacity and the well-functioning congestion management are important elements for the development of the internal market, it is important to underline how this issue needs to be addressed in a non-discriminatory way. Furthermore, this regulation includes rules on how revenues of transmission system operators (TSOs) have to be spent (for example, in capacity allocation). However, the firm can obtain an exemption from these obligations if it demonstrates that revenues are used for other investments enhancing competition and that would not have taken place otherwise. Nevertheless, this exemption rule has obtained poor results. Only two exemptions have been requested until now (European Commission, 2007).

As will be shown, the long-term impact of liberalisation on lack of incentives for investments in interconnection infrastructure is one of the main problems not adequately addressed by the European regulatory framework.

As indicated by the European Commission in the Energy Inquiry (European Commission, 2007), several obstacles still prevail in the electricity sector limiting the results achieved by the European liberalisation process. Several issues have been raised in the report about difficulties in the achievement of the internal market and about the competitive environment. The five main barriers of the achievement of fully internal market are: concentration, vertical foreclosure, lack of market integration, lack of transparency and increase in prices. The report has also indicated the future policy of the European Commission toward the electricity sector. Among other future objectives,⁵ the Commission has the intention to pay more attention to mergers and acquisitions at European level. Nevertheless, it can be argued that this action is being considered in retard. Some comments will be addressed in next paragraphs.

Moreover another main problem, expressed also in the Green Paper (June 2006) on the energy sector, is the lack of incentive in investments in international interconnections (European Commission, 2006). The discussion will point out the importance of implementation of the internal market to ensure competition at the European level.

2.2. The second and third pillar: other difficulties arise

This paper is focussed on the liberalisation and the internal market issues. Nevertheless, the strong complementarities and interconnections of these objects with the other two main pillars of the European electricity policy do not allow avoiding them in the discussion. Hence it is indispensable to briefly analyze the difficulties arising in the

achievement of the other two pillars, security of supply and environmental protection, and the influence of the internal market on them.

As mentioned before, security of supply is the second objective in the European Energy Policy. Some issues about security of supply are included in the Regulation 1228/2003/EC and in the Directive 2003/54/EC. Nevertheless the need for a specific regulation in this subject has been satisfied with the Directive 2005/89/EC on the electricity supply and infrastructure.⁶

The political influence on this sector has been already mentioned. It has led most Member States to an excessive electricity generation capacity. However, the increasing future demand for electricity and the need to maintain the existing plants require continuous investments in the sector. The European Commission calculated that Europe will need approximately one trillion of euros to meet the growing energy demand in the next 20 years (European Commission, 2006).

Even if it is difficult to assess the optimal level of investments to meet future demand, several authors argue that problems can easily arise in the near future. The recent blackouts (also in summer 2006) can suggest that the need for new power plants and investments in interconnections will be indispensable in next years. If on the one hand market should determine the optimum level of investments, on the other hand any lack of incentives for market players in this particular sector could delay the creation of new capacity and interconnection, threatening in this way the short-term security of supply.

Other difficulties are caused by the third objective of the European Electricity Policy, the environmental issue. Different directives have been adopted in order to protect the environment toward the sustainable development. The Directive 2001/77/EC requires Member States to increase the share of green energy sources in the production of electricity to 22% by 2010. Moreover, it has also required Member States to provide incentive mechanisms to promote investments in green power generation.⁷

The directive 2003/87/EC on the emission trading has introduced the European Greenhouse Gas Emission Trading Scheme (1st January 2005) where energy generators producing less emission can sell the exceeding allowances to other and more polluting generators.⁸

While this issue is not analyzed in detail in this paper, it would be still important to stress some interrelation

(footnote continued)

allocation of the cross-border capacity. Moreover, it contains rules to incentive private investments in the network.

⁵It will take strict control on state aids, will implement more antitrust investigations (for example on vertical foreclosure for long term downstream contracts) and will take a closer look at price formation in energy wholesale markets. Also the “grandfather’s right” on capacity as barrier to entry, will be considered.

⁶It obliges Member States to maintain a sufficient level of network security with transparent market rules. This directive will be implemented in December 2007.

⁷This directive and the directive 2004/8/EC regarding the promotion of cogeneration include priorities in the network access for green electricity producers.

⁸The Directive obliged electricity generators which use thermal energy sources and have an input of more than 20 MW to produce only if they have greenhouse gas permit. It is important to remember that the internal market is indispensable for the emissions trading mechanism to work properly.

between the liberalisation issue and the green energy policy. If the liberalisation process leads toward higher efficiency, then the green energy can help this objective by both lowering social costs of pollution and enhancing (green) power capacity. Nevertheless the share of green energy produced in Europe is far from policy target provisions (Perez-Arriaga and Barquin, 2005). Different problems, such as the lack of investments, the so-called carbon lock-in,⁹ and the need to recover investments of old power plants, still create difficulties.

Moreover, we should not forget that the environmental policy coupled with the technological development has brought changes to the electricity sector. Different studies estimate that the level of CO₂ emissions coming from the electricity sector represent one-third of the global CO₂ emission (Unruh, 2000). The European environmental policy goal and the development of green technologies have given the incentive toward some transformation in generation plants.

The technological developments in this industry should hence not be underestimated. As will be seen, the new gas fired plants have also been promoted for environmental reasons. This change has effects not only on the achievement of the third pillar, but it is leading toward concentration between electricity generators and gas suppliers, generating additional complexity to the European Electricity Policy.

In sum, the environmental pillar, together with other reasons, has led to a change in technology and indirectly in the industry structure of the electricity sector. This change of industry structure can lead to some risks for competition and hence to the creation of the internal market. Nevertheless one can argue that an adequate level of investments in the interconnection infrastructure can represent one main solution to overcome these risks.

3. Concentration in the internal market

One of the main features of the electricity deregulation process is the unbundling of the network infrastructure from other segments, ultimately aiming to enhance competition in the segments of generation and retail. Nevertheless, the process of liberalisation has been followed by a wave of consolidation. One of the main reactions of incumbents to the regulation has in fact been the concentration, in order to maintain their market share. Moreover, the liberalisation process has created the chance to expand the business in other Member States creating new opportunity for profits.

One of the main objectives of liberalisation is to increase the geographical size of the market and thereby to promote competition where the most efficient producers have the largest market share (Jacobsen et al., 2006). It is natural that incumbents in the electricity power sector try to maintain their position after liberalisation. Nevertheless,

the way they achieve this position is not always the most efficient. They exploit their position as former state-owned and vertically integrated monopolies. One of the risks of the concentration is that big incumbents try to enhance barriers in order to maintain their position and to foreclose the entrance of more efficient market actors (Ringel, 2003).

Thus, although the liberalisation process has led to the disintegration of national monopolies, it did not lead to less concentration within the sector. The European situation is quite far from the internal market and open competition. There still exist different national and regional markets with the presence of incumbents as main actors in each electricity market. Despite liberalisation, the level of concentration is hence quite high. For example, among the traditional 15 Member States the level of concentration is high: the first three European generation power firms have 60% of the market in 10 different countries (European Commission, 2007).

Table 1 shows the generation capacity of major companies compared with the demand in 2004 in some of the EU15 Member States. This data collection and the resulting concentration ratios for main players in the market, helps us to understand the high level of concentration in national industries.

Moreover, recently mergers and acquisitions activity in Europe has increased both at national and international level. National companies have consolidated and strengthened their position on markets also with the acquisition of small utilities. There is a clear path toward concentration across Europe. Some authors have realistically predicted that in 10 years there will be around 7–10 significant players in the European electricity market (Codognet et al., 2003). Others argue that this trend will lead to the creation of “seven brothers” comparing it with the industry structure evolution in the oil sector and the formation of the “seven sisters” (Thomas, 2003).

There are different reasons for this growth in size. There can be different advantages created by mergers. The entrance of new firms can lead to a decrease of market share of incumbents. The acquisition of other players reduces this risk. This situation can limit the effective competition in the generation wholesale markets.

The data also reveals that the UK¹⁰ and Scandinavian power generation markets are less concentrated than others. In these two regions the existence of regional markets is the main explanation of lower concentration ratio. These two experiences are hence good examples of the benefits of the internal market in all Europe. However, in other regions and

¹⁰An important lesson derives from privatisation in the UK. The British privatisation program in the electricity wholesale market has avoided the creation of “national champions”. This situation has allowed the entrance to the British market of different foreign generators with important market shares, such as the German company E.ON and the French EDF (see Table 1). Hence, the real implementation of privatisation in the electricity generation market has avoided the political influence in this sector. In other words, effective privatisation could be the cure against “national champions” in some Member States.

⁹For a detailed discussion on carbon lock-in, see Unruh (2000).

Table 1

Member state	Demand (TWh)	Companies	National production company (TWh)	Concentration	Ratio (%)
Spain	260	Endesa	98	c1	38
		Iberdrola	66	c2	63
		Union Fenosa	26	c3	73
		Hidrocantabrica	15	c4	79
Portugal	51	Electricidade de Portugal	25	c1	49
France	477	EDF	429	c1	90
Belgium	88	Electrabel	76	c1	86
Germany	554	E.On	150	c1	27
		RWE	140	c2	52
		Vattenfall Europe	83	c3	67
		EnBW	55	c4	77
UK	390	British Energy	73	c1	19
		E.On UK	35	c2	28
		RWE	33	c3	36
		EDF Energy	25	c4	43
Austria	62	Verbund	30	c1	48
Scandinavia	379	Vattenfall	88	c1	23
		Fortum	54	c2	37
		Statkraft	34	c3	46
		E.On Nordic	33	c4	55
Italy	322	Enel	126	c1	39
		Edison	48	c2	54
		Edipower	25	c3	62
		Endesa Italia	21	c4	68

Source: Own elaboration on data [Matthes et al. \(2005\)](#), Vattenfall annual report 2005, website companies.

countries market concentration remains quite high. In some countries, such as in Spain, Portugal and Italy the concentration ratios have slightly decreased in the last years but still remain high. In Germany, large mergers in recent years have even increased market concentration ([Matthes et al., 2005](#)). Moreover, most of bigger generators also play an important role in the other segments of the industry. Some of them are diversified in other businesses, related or not to the electricity sector. As will be pointed out in the discussion, high concentration ratio and interaction in different markets can lead to anticompetitive behaviors of generators.

The focus in next two sections is mainly on the new trend toward consolidation implemented by big generators. Two complementary aspects will be analyzed: the trend toward the creation of “national champions” and the new wave of mergers between gas suppliers and electricity generators. Both strategies have been taking place in recent years and they are in some way essential to understand in which way these situations will affect the liberalisation process.

4. National champions and governments

As mentioned before, the European Community Energy Policy is mainly oriented towards the achievement of three

goals: more competition, security of supply and green energy. Nevertheless, in these last years it seems that these objectives have been supplemented by a national one. Indeed some Member States seem to follow the additional objective of creating “national champions”, implementing a favorable policy toward mergers of national generator incumbents with other firms, mainly in the same segment.

To better understand this situation, the development of two recent mergers in the last month in Europe will be briefly analyzed here.

In September 2005 the largest gas supplier in Spain, Gas Natural, launched a takeover bid for the largest electricity producer in Spain, Endesa. Few months later, in February 2006 the German electricity and gas company E.On launched a counter bid for Endesa. Overruling the decision of the Spanish competition authority, the Spanish government implemented a special decree in order to protect Endesa from E.On’s bid. After 1 year, last September, the European Commission has declared this takeover compatible with the EC Treaty. Nevertheless, the increase of the bid of E.On has not been taken positively by the market and the situation seems still complicated.

The second merger was between the former-gas monopoly in France, Gaz de France (GDF) and the French company Suez, holding the highest market share of

electricity production in Belgium. This operation was clearly a quick defence move in order to counter Suez's hostile takeover launched by Enel, the largest electricity operator in Italy. Also the French government has clearly applied the policy of defending the "national champion". Moreover, the European Commission has given its authorisation (subject to remedies) for the creation of the first energy group in Europe.

In general national mergers are seen as having bad influence on the liberalisation process, while cross-country mergers and acquisitions are seen as having positive effect on the internal market implementation (Durand, 2006).

This can be true in one way, but before judging, it is essential to have a clear picture of this strategy. The issue should be assessed in a dynamic perspective. National mergers have been implemented also in past years. For example, in July 2002, the German government has authorised a merger between the largest electricity producer E.ON and the largest national gas supplier, Ruhrgas. This merger has created a "national champion" against the opposition of the national antitrust authority, the German Federal Cartel Office. The EdP/GdP mentioned in footnote 11 is another (unsuccessful) example of promotion of a national champion.

This policy seems common to incumbents, growing domestically, then competing internationally. Big players want to expand abroad also to exploit revenue opportunities of new market deriving from the liberalisation process (Durand, 2006).

This situation brings out the importance and vitality of the energy sector also in the view of political decision makers. The belief that the energy sector should be in some way "controlled" for national reasons seems still as strong as 50 years ago and politicians are still interested in it.

In this sense, it can be argued that market based deals are positive while politically based deals are dangerous. Some implication can also come from the GDF/SUEZ/Enel case. If in one way the French government has protected Suez from the "hostile" foreign takeover by Enel, then the answer of the Italian government should not be in the same line? In other words, in order to compete strongly at international level, should the Italian government let Enel to implement a merger with ENI?¹¹

It is interesting to underline how the political influence on the electricity sector in protecting national incumbents is not really an efficient policy. Governments arguing the strategic importance of the sector, have overruled national antitrust decisions. Mergers and acquisitions should not be banned *per se*, but they should be market based and not politically motivated. In moving toward liberalisation the involvement of national government should be minimised.

Political intervention in the electricity sector has also been facilitated by the two-third rule in the European merger regulation. The regulation 139/2004 on the control of concentration between undertakings (European Com-

mission Merger Regulation, 2004) specifies in the article 1 that if firms involved in the concentration achieve more than two-third of their aggregate Community turnover within one and the same Member State, then the European Commission does not have the competence to decide for the case,¹² but leaves it to the Member State.

Then one issue arising is represented by the fact that the merger regulation should be enforced in a different way in the electricity industry. If the final objective of liberalisation is to create the internal market, then the structure of the electricity sector presents some difficulties in achieving this goal: the interconnection capacity for cross-border trade is limited and incumbent firms are in general dominant in the home country.

One way to solve this problem could be the change of the two third rules in the case of electricity and gas sector, perhaps on the base of the subsidiary principle. This would allow the European Commission to intervene. Nevertheless some questions will arise in this case, in particular whether the European Commission is in a better position to decide on a merger at national level compared to a national authority. The European Commission, for example, needs to foresee future changes in market structure, the probability that some anticompetitive behavior will be undertaken and moreover it has to establish if remedies proposed by the parties are sufficient (Nilsson, 2005). This situation will definitely lead to what is called in literature Type I and Type II errors. Type I error means to prohibit a merger that is not anticompetitive, while Type II error means to allow an anticompetitive merger. Some studies have suggested that Type II errors are more harmful in the case of electricity sector because of the low elasticity of demand (Barquin et al., 2006). The exercise of market power deriving from an anticompetitive merger will in fact bring important losses to consumers. In the case of Type I errors, the loss to consumers depends on the extent of low prices¹³ (Lévêque, 2006). However, this analysis does imply that competition authorities should implement a rigid approach toward mergers and acquisitions in the electricity sector, but only that they should consider with more attention all the pros and cons of mergers, taking into account the high level of uncertainty of their decision.

The United States represents a good example of having a central electricity authority, the FERC, with specific competences in this particular sector (Newbery, 2005). Nevertheless, the need for a specific European regulator is

¹²To show how the European Commission can influence mergers in this sector, it is useful to remember that in 2004 in the case of merger between the first electricity company, Electricidade de Portugal, and the first gas utility, Gas de Portugal, the European Commission prohibited the merger. The prohibition was decided because the operation would have strengthened the dominant positions of the merging companies in that Member States. The Commission intervention was possible because Electricidade de Portugal generates more than one-third of its turnover outside the country (Lévêque, 2006).

¹³This statement is supported by different studies demonstrating that past merger and acquisition in the electricity sector did not reach the goal of efficiency (Anderson, 1999; Becker-Blaise et al., 2004).

¹¹It is useful to remember here that 30% of Enel is still state-owned.

not felt because the internal market is still far from its implementation.

The solution of this problem will be a better implementation of the second electricity Directive 2003/54/EC regarding the power entrusted to national antitrust authorities and in particular to their independence from national governments. But this would not solve another problem, the risk of capture of national authorities by incumbents.

Also if a modification of the Two-Third Rule of the EC Merger Regulation can be today claimed, changes in terms of merger and acquisition are already setting up a new market structure.

In absence of European policy, Member States will continue to pursue their “economic patriotism”, attempting to address the fourth objective of national champion instead than cooperating with other Member States in order to reach the real goals of the European energy policy.

Furthermore, there is no indication that a national champion will pursue the general interest better than a foreign firm. The same obligation on the general interest service would bind both national and foreign firms. We can rather suspect that governments are protecting the interests of some organised groups and not the general welfare.

This situation shows that national governments are partially responsible for obstacles still present in the liberalisation process of the electricity sector. They are not completely willing to open the electricity market. It seems ironic if we think that the EU started 60 years ago, before with coal and then with nuclear energy as the main objective for integration.

Today, instead we see how several Member States are “dragging the feet” in implementing the European directives whereas the European Commission has initiated several infringement procedures against these Member States.

5. The integration between gas suppliers and electricity producers

In general, it is possible to classify mergers and acquisitions as geographic diversified or geographic focused. Moreover we can distinguish them between convergent mergers (electric utilities merging with natural gas utilities) and nonconvergent mergers (electricity firms acquiring other electricity firms) (Becker-Blease et al., 2004). Recent trend toward convergent mergers is hence the focal point of the analysis in this section.

To illustrate the changing strategy at European level, it is interesting to analyze actual strategies implemented by incumbent generators. In these last years several mergers between natural gas companies and electricity producers have occurred. Some examples are presented here.

In Germany, in November 2000 there was a merger between RWE and VEW. Also in Germany, another merger occurred in May 2002 between E.On and Ruhrgas. In Finland, the company Fortum has been active in merger

with gas companies: in June 2000 it merged with Stora Enso Oyj Power (a gas producer) and in February 2002 it merged with NYA BIRKA Energi, another big player in the North Pool, in particular from Sweden. Also in Italy, a merger occurred between Italgas and Edison in August 2001 (Toh, 2003).

Furthermore, more recently, different case regarding convergent mergers have been addressed by the European Commission. Some examples on integration between gas suppliers and electricity generators in the EU15 are represented by the case Dong/Elsam/EnergiE2, the acquisition of MOL by E.On, the merger E.On/ENDESA and the merger between GDF and the Belgian Suez.

This trend is not circumscribed only to the EU15 countries but it is developing also in new Member States. Examples are represented by the E.On acquisition of the Hungarian MOL, the acquisition by the Spanish Endesa of the polish electricity operator Zedo and the ENEL acquisition of the Slovakian Elektrarne.

Some authors suggest that the electricity generation market will be transformed in a small number of years in an oligopolistic market with a few actors in this segment and with high degree of vertical integration upstream in the natural gas supply.

Before analyzing the economic reasons behind process of convergent mergers, it is important to mention that the technological development of gas combined cycle turbine is a leading cause transforming gas into one of the main important sources for electricity production.¹⁴ The important advantages of the gas combined cycle turbine explain why several new power plants are built with this technology. However they do not completely explain the economic reasons behind the trend of vertical integration between those two sectors. Different efficiency reasons can be found.

First, vertical integration with gas supplier can be motivated by reductions in transaction costs (Eikeland, 2007). In the electricity generation sector this can be true also if we have to remember that relationships between gas suppliers and electricity generators are in general regulated

¹⁴During the 1990s in fact two main elements such as the gas combined cycle turbine and the liberalisation process have changed the connection between gas and electricity sector in Europe. Firstly, the use of gas as power generation due to the combined cycle gas turbine and the increase of gas reserves (not anymore considered a noble source) have tightened the connection between these two industries. This technological innovation can be one factor for the explanation of the recent trend toward integration between these two industries.

Secondly, the gas fire turbine power plants are more efficient in this new competitive environment created by the liberalisation process. This type of power plants in fact requires lower initial investments and shorter period to build compared to other kind of plants. In this way, new actors and incumbents should be encouraged to invest also if the uncertain conditions of the market created by the liberalisation do not give incentive for long-term investments (Toh, 2003). Moreover, this kind of technology presents low degree of returns of scale, eliminating another entry barrier for new generators. Finally, the electricity production coming from this technology is less polluting in terms of CO₂ compared to other electricity sources such as coal.

by long-term contracts. Nevertheless the classical decision whether to “make or buy” represents part of the explanation. Second, the acquisition of firms in the gas sector, presenting numerous similarities with the electricity industry, allows synergies in terms of already acquired experience in the field. Third, like long-term contract in the forward market, mergers allow generation power firms to better hedge the risk of price volatility in natural gas and electricity. The price fluctuation of electricity production sources generates risks, and risk is a disincentive for investment. In order to minimise these risks, firms try to put more energy sources under their portfolio. Fourth, a vertically integrated electricity generator can decide to produce less electricity and to sell more gas to downstream competitors in periods of peak demand. In other words, generators can produce electricity or arbitrage and sell gas if this second option is more profitable. Fifth, this strategy can be also seen as a business diversification strategy and in this way it is possible to compensate the losses coming from one sector with the revenue in the other sector.¹⁵

Finally, it is important to remember that this trend toward vertical integration is being applied by most of incumbents in the electricity sector. Then, this strategy is a reaction in order to compete in a “horizontal way” with other upstream integrated electricity firms (Eikeland, 2007).

6. Some “risks” coming from liberalisation

The picture analyzed above is not static. Other mergers will occur in the future also among big players. Liberalisation has allowed an unprecedented level of mergers and acquisitions in the European electricity industry. On the one hand, these concentrations can generate efficiencies, but on the other hand they can also bear some anticompetitive risks. Firstly, considering the limited cross-border interconnection capacity, the actual risk is represented by the increasing in market power in several Member States or regions of few big actors. Secondly, this process of concentration can encourage future collusion among a few vertically integrated big players.

6.1. Exercising unilateral market power

The exercise of unilateral market power is a well-known problem in the electricity sector. Wholesale markets are generally vulnerable to the exploitation of market power by generators (European Commission, 2007). This situation especially depends on the characteristics of the electricity such as on the fact that this commodity is not storable and demand is inelastic. Moreover, as the price is influenced by

the highest offer made in the wholesale market, prices are higher when more expensive inframarginal plants are utilised.

Generators can influence prices mainly in two ways. They can withdraw generation capacity or charge high prices in peak demand periods. In the former case, the generator withdraws capacity¹⁶ in such a way that losses from less quantity produced are more than compensated by gains from charging higher prices for all the other quantities sold on the market. In the latter case, although the generator can charge high price also if it does not have big market share, it is the owner of the inframarginal power plants which are indispensable to meet the higher demand.

Generally big incumbents have base-load plants (coal or nuclear) and hence they can exercise market power in the first scenario presented above. Other generators owning the inframarginal plants are instead interested in charging high prices during peak load demand, as in the second scenario (European Commission, 2007).

The transmission capacity constrains also play an important role. In fact, if it is not possible to deliver electricity in one region because of transmission constrains, then in case of peak demand the abuse of market power by a small inframarginal generator is probable also in non-concentrated markets. This situation would not happen in case of interconnected markets: the competition of different inframarginal generators should limit the abuse of market power also in peak demand periods. Moreover, all generators gain from an increase of prices in the electricity wholesale market.

Furthermore, through convergent mergers it is possible to use market power held in one market in order to influence another upstream or downstream. Although they can be considered separate markets, competition problems can hence arise when the electricity and gas actors are big players or dominant in one specific area. The competition problem can be even bigger if the two firms operate in the same geographical area. This would guarantee to one electricity producer the control of one of most important energy source for the production of electricity in next years. There are two types of foreclosure risk: (1) foreclosure of access to gas supplies if an integrated firm is dominant in the wholesale gas market, (2) foreclosure of access to customers if the integrated firm controls a large proportion of the gas-fired power stations. In the EdP/GdP merger both dangers were present. Vertically integrated incumbents could hence be able to manipulate the wholesale price in order to create difficulties to the new entrants. For example, in the absence of continuous monitoring, an upstream-integrated incumbent can sell the gas production at higher price than it does for electricity firm in its group, generating difficulties toward the achievement of the competitive market. In these cases, to avoid problems, the new entrant has to enter at the same time to both the

¹⁵Different electricity producers are diversified in a multitude of business and for these reasons they are often called giant multiutilities. Enron represents one of the most famous cases, mainly for the achieved results. In fact the incorrect accounting system and the wrong provisions on the combination of telecommunication and energy business had great influence in the collapse of this multiutility (Toh, 2003).

¹⁶It can be used also for ordinary or extraordinary maintenance as motivation to withdrawn capacity.

gas and electricity market. This situation represents an entry barrier because it enhances investments and costs (due to the increase in risk) for new actors.

6.2. Future collusion and multimarket contact theory

A second category of problems is represented by the existence of particular features of this sector favoring possible future collusion as a successive step after the wave of mergers.

This sustainability of collusion depends on the size of potential short-term gains from a deviation compared with long-term losses of punishment. The literature has identified several factors facilitating this sustainability within one industry. In the case of the electricity sector, different elements can introduce the suspicions of future collusion among market players.

First of all, a small number of electricity power generators will dominate the European electricity market. These “brothers” will be able to monitor each other facilitating collusion. One of the characteristics of electricity as commodity is its homogeneity, making easier monitoring among firms.¹⁷ In this sense, the power to monitor the national regulatory authorities has been enhanced by the second electricity directive, but a regulatory authority at the European level does not exist (compared to the US FERC), this makes the continuous monitoring of prices and market anomalies difficult.

Another element is represented by the upstream and downstream integration of generators, respectively, in the gas sector and retails segment of the electricity sector. As already pointed out for mergers between gas and electricity generators, this situation increases entry barriers of new entrants. In the absence of continuous monitoring, vertical-integrated incumbents can be able to manipulate the wholesale price in order to create difficulties to new actors. In these cases, to avoid problems, the new entrant has to enter at the same time in different markets.

In connection to this situation, the theory of cartels recognises territorial exclusivity as one factor giving incentives to cartels among firms, allowing them to exercise market power in their own territory. Even if territorial exclusivity did not exist in the electricity sector, there are still important similarities to consider. The network infrastructure and its capacity constrains limit to some extent the electricity that can be introduced in the grid. In this sense, incumbents enjoy the location advantages, which they can transform into market power. In some manner this can represent the way to split up the territory. This situation may express one of the reasons why lack of investments in interconnection capacity still persists. There is no incentive for incumbents to invest in interconnection, because it would give more scope for competition and

hence less possibility to exploit market power in a particular region. If on one hand the lack of cross-border interconnection may seem to make collusion among a few big firms difficult in the near future, on the other hand it can represent a common strategy of incumbents in order to maintain market power in their territory.

Moreover the electricity sector is experiencing a present and future path of demand growth. This feature facilitates collusion, in fact demand growth can enhance the long-term cost of punishment, giving hence less incentive to deviate from collusion. Nevertheless this characteristic is strongly related to the effectiveness of entry barriers in the sector.

All factors described above can facilitate collusion within one electricity market. Nevertheless another important factor, this time external, needs to be considered in order to comprehend real conditions of competition in the electricity industry. Strategic linkage of existing markets or the expansion into new markets is essential in understanding the possible outcome of competition in the electricity sector.

It is hence necessary to recall here the multimarket contact theory. [Edwards \(1955\)](#) pointed out that when firms meet in several markets, these multiplicities of contacts can have important effects on conditions of competition and in particular on the possible incentives for collusion. Several authors have criticised this view, because if a firm is present in many markets, it can deviate in all of them at the same time. In other words, this situation has a double effect: on the one hand, it enhances the long-term cost of punishment but on the other, it also increases the short-term gains of cheating. The fact that firms co-exist in several markets is hence not sufficient to explain a possible outcome of collusion, it can plausibly enhance cost and benefit in the same proportion. [Bernheim and Whinston \(1990\)](#) in particular explain when the co-existence of firms in different markets can also be irrelevant. They explain that with perfect monitoring, identical markets, identical firms and technology with constant returns to scale, multimarket contact does not affect the conditions of competition. Nevertheless, they also indicate different plausible circumstances where this theory can facilitate cooperation among firms. For example, if the demand growth path differs across markets, then the punishment cost from rapidly growing markets can be a deterrent also for the slowly growing markets ([Evans and Kessides, 1994](#)). Second, if the production cost of firms differs across markets, then actors can influence each other. In this case a firm might be able to convince a competitor not to undercut price in a determinate market with the threat to undercut in the second market where it has a lower cost production. Third, if the number of actors in each market differs across market, than firms can transfer the collusive outcome of an oligopolistic market with a few actors to another more competitive one, whereas collusion would not be otherwise possible. This is feasible because the threat of undercutting in the oligopolistic

¹⁷While some consciousness about costs of competitors can exist, we do not have to forget the existence of asymmetry of information among regulators and market players in assessing costs.

market will make firms (present in both markets) compliant also in the competitive one. Several empirical studies have hence provided evidence with different degrees of significance the fact that multimarket contact enhances profits in several sectors such as airline, bank, cement, mobile and other industries (Pilloff, 1999).

Focussing now the attention on the electricity sector, the main incumbents compete in different geographic and product markets at the same time. As shown in Table 2, all major European players in the electricity sectors are active in both electricity and gas sector in different geographical markets. Moreover, they are active in different segments such as generation, distribution and/or retail in both sectors.

An analysis of the electricity sector in the light of multimarket contact theory leads to some interesting results. First, there are different electricity markets across Europe, mainly because of lack of interconnection. Second, firms in this industry are heterogeneous for market share, markets served and kind of businesses across European markets. Moreover, each firm has a different portfolio of generator plants and hence different production costs. Third, technological returns to scale represents the discount factor to assess the present value of gains from cheating and future losses for punishment. As Bernheim and Whinston underline, it is realistic to assume that multimarket contact can generate potential collusion if firms attach more weight to future revenues. This can be exactly the case of the electricity sector where there is a general path of growing demand and where, thanks to the liberalisation process, new markets are being exploited by incumbents. Moreover, the overall consumption of electricity and energy in general is growing slowly in old Member States while it is increasing more in new Member States, representing new markets for electricity companies (Eurostat, 2006). This situation can provide incentives to transfer the collusive outcome of a mature oligopolistic market with a few actors to other more competitive ones. In general, the interconnection among generators across European markets needs to be taken into account in order to avoid the future development of “spheres of influence” enabling firms to sustain higher levels of profits.

Various measures have already been taken by the European Commission and national authorities,¹⁸ but other steps need to be considered in order to avoid all

these risks. The following section analyzes in detail how these risks can be overcome by a better implementation of the internal market.

7. Enhancing investments in interconnection: the internal market as solution to overcome anticompetitive behaviors?

Having analyzed the possible anticompetitive problems resulting from the process of consolidation, it is now important to point out how the implementation of the internal market can represent one of the main solutions to these risks. Moreover, in this way it would be possible to reach also the second objective of the European electricity policy, security of supply. Although some progress has been made in recent years, the situation is still far from the internal market.

Several advantages are expected to result from the creation of the internal market. First, the increased competition thanks to cross-border trade will increase interaction among competitors. The creation of the internal market is expected to increase competition thanks to major interconnection capacity and hence the reduction of possible negative effects coming from the high level of concentration at national and regional levels.

Second, with more interconnection, the need for spare capacity will decrease, thus enhancing efficiency. In this way, the risk of black-outs will diminish with more capacity available in all Europe. At the same time the level of spare capacity for each country will be lower. Lower spare capacity means the maintenance of less costly power plants and the utilisation of the cheaper inframarginal power plants available at the moment of peak demand. This situation will have the final effect of lower prices for consumers.

Nevertheless the achievement of the internal market in Europe is still far from being completed. The infrastructure has been built to meet national needs and not in anticipation of the internal market. This brings regular problems of network congestion in cross-border trade, particularly in Italy, Spain and Portugal.

There are differences in prices among Member States. The day ahead price level in 2005 varied from more than 51 euro in countries such as Italy to less than 30 euro in the Nord Pool¹⁹ (European Commission, 2007). The lack of cross-border interconnection is a barrier to cross-border trade and hence differences in prices persist (Brunekreeft et al., 2005).

The energy inquiry of the European Commission has shown that most of the interconnection network infrastructure between Member States is congested, meaning that demand is higher than the existing network transmission capacity. A few exceptions are represented by the interconnections between Italy and France, Belgium and France, Germany and Austria. Nevertheless the trend of

¹⁸For example, to mitigate the market power of electricity incumbents, many regulators are using the instrument of virtual power plant. With this system the incumbent generator has to sell part of its production to other market actors. Nevertheless, this sale is only virtual, the incumbent generator remains the owner of the power plant and its production does not change, but this production is controlled by another market actor that pays the variable production costs to the incumbent. This is considered a behavioral remedy. This virtual divestiture is preferred to a real divestiture because of the changing nature of this industry. When markets become more integrated and the incumbent's dominant position is weakened, it can recover control over its production (Willems, 2006). In this way, authorities can reduce concentration and promote competition without taking irreversible decisions.

¹⁹Nordic countries reached the network connection in the 1990s creating the Nord Pool and hence taking advantages also from the integration of the hydro-based system from Norway.

Table 2

Electricity utilities (including subsidiaries)		DE	UK	FR	IT	HU	NL	PT	AT	BE	ES	PL	SK
EDF	E	■	■	■	■	■			■	■		■	■
	G	▲	▲	▲	▲								
E.On	E	■	■		■	■	■		■		■		■
	G	▲		▲	▲								▲
ENEL	E				■						■		■
	G			▲	▲						▲		▲
Electrabel	E	■		■	■	■	■	■		■	■	■	
	G	▲			▲		▲			▲			
RWE	E	■	■			■			■	■		■	■
	G	▲	▲			▲	▲		▲	▲			
Endesa	E	■		■	■			■		■	■		
	G							▲			▲		
Iberdrola	E		■								■		
	G		▲								▲		
Centrica	E		■							■	■		
	G		▲							▲			
Vattenfall	E	■										■	
	G												

Source: Own elaboration based on companies annual report (2005).

congestion in cross-border interconnection capacity is increasing. Different European electricity markets remain separated and imports are limited, with important negative effects. First, market concentration in power generation in Member States remains high creating the possibility to exploit market power. Second, consumers in some Member State continue to pay more than others for electricity.

The Barcelona Council has required a level of interconnection capacity in terms of imports for each Member State of at least 10% of the internal production capacity. This target has not been met by all Member States.²⁰ Other Member States, despite having respected this target, did not solve their congestion problems. Holland is one example (European Commission, 2007).

Several problems can arise from this situation. It is difficult to assess benefits from cross-border trade. It can be useful to analyze the case of an electricity market integrated within a broader one. In this case the generator (within one region) with low production costs will export energy to the other connected markets. But in this way, the price will increase also in the region where production takes place. Then, it will be difficult to assess if losses for some consumers are lower than gains for others (Green, 2006).

The advocates of free competition often argue that market will provide the right level of investments in interconnection. Nevertheless some worries can be derived because of the particular features of some segment of the electricity sector. For example, the building of new and unregulated cross-border interconnection capacity (merchant capacity) can pose complex problems for various reasons such as coordination and difficulties to obtain environmental permissions. Moreover increasing cross-

border network capacity is not enough if the internal network capacity is not sufficient to transport this electricity. This is the case in many European countries, where domestic transmission interconnection infrastructure has been built for internal needs.

The European Community has implemented two main mechanisms to promote investments in interconnection capacity.

The first one is the Trans-European Energy Network Program (TEN-E) providing financial support to interconnection investments²¹ (Meeus et al., 2005). Nevertheless this program does not represent large share of investments in interconnection capacity (European Commission, 2004).

The second mechanism derives from the actual framework for investments in interconnection included in the Regulation 1228/2003. Article 6 requires that revenues coming from the allocation of interconnection capacity (congestion revenues) have to be used for one or more of three main purposes: (a) ensuring the availability of allocated capacity; (b) investments in increasing or maintaining the interconnection network; and (c) lowering network access fees.

Nevertheless, the European Commission's energy sector inquiry shows how most of transmission operators prefer to use the extra congestion revenue, to reduce interconnection tariffs instead of investing in transmission. This is a cosmetic solution that favors both incumbents and TSOs themselves, making the entrance of new actors more difficult. First, without real separation of the transmission and distribution network operators from generators, incentives to invest in cross-border interconnection infrastructure are really difficult to assess. Less interconnection

²⁰Italy, Spain, Ireland, Portugal and Poland have not respected this requirement.

²¹The program usually co-finances project in interconnection up to 50% of the total cost of the investment.

indeed guarantees national market power to incumbents. In this sense, the second electricity Directive needs to be implemented, not only in a formal way but in order to guarantee a real separation of these segments. Secondly, it is indispensable to change the provisions of Regulation 1228/2003 in order to give the right incentives to TSOs to increase their network infrastructure investments. A TSO may be reluctant to invest in interconnection because this will lower its congestion revenue.

One of the main explanations for the slow advancement of the internal market for electricity is indeed the inadequate unbundling of supply activities and network businesses. When electricity suppliers are also owners of the interconnection infrastructure, the incentive to invest can be distorted. Moreover, for the same reason it is difficult for regulators to ensure a nondiscriminatory Third Party Access. Two main options are considered by the European Commission in order to deal with this issue. The first is to impose a full separation of ownership for TSOs owning and operating the network. The second option is to separate ownership from the operation of the system. An independent system operator (ISO) will deal with this task, while generators can continue to own the infrastructure (European Commission, 2007). It can be argued that the first option seems preferable because it gives the right incentive for both nondiscriminatory access to the infrastructure and investments in interconnection. Nevertheless the intervention of regulators will be still essential to ensure incentive to invest for TSOs and to avoid the exploitation of scarcity rents.

Another solution used is the creation of some incentive for generators to invest in the existing interconnection capacity, giving them some priorities to recover investments. But such priority means to charge some advantages in using the transmission capacity and hence it leads to anticompetitive disadvantages that the European Commission attempts to eliminate with unbundling.

In sum, enhancing interconnection among Member States can lead to different advantages, mainly increasing competition and assuring a more efficient security of supply. Nevertheless several problems exist in achieving this objective. In fact there is a lack of incentives for TSOs to invest in cross-country interconnection. First, there is a prior need to invest in maintaining the national grid. Second, congestion guarantees extra revenues to these operators. Third, it could be possible that TSOs maintain a low level of investments because of the connection with the interest of the big national incumbent generators.

8. Conclusions

Over the past years a number of changes have occurred in the European electricity sector. At the same time the complexity of the industry has led to difficulties in implementing the liberalisation process.

The theoretical framework of the European electricity policy seems well designed, nevertheless its implementation

poses numerous problems. Several elements do not allow the achievement of the internal market in the electricity sector. Although the second package of electricity directives has attempted to correct the limitations contained in the previous legislative framework, several problems still exist.

To this picture we have to add the main reaction of incumbents to the new environment created by the liberalisation process: the strategy toward concentration. The particular characteristics of this sector coupled with the recent trend of mergers and acquisitions have in fact enhanced the risk of abuse of market power and future collusion. While in absence of interconnection, the abuse of market power of incumbent is a present threat, the multimarket contact theory has indeed underlined how several characteristics of this sector can induce future risks in developing “spheres of influences”.

The lack of effective privatisation in some Member States, the absence of independence of regulatory authorities from national governments and the two-third rule allows the formation of non-market-based “national champions”. Moreover, the trend of convergent mergers between gas suppliers and electricity generators needs to be considered. Even if on the one hand these concentrations are driven by efficiency reasons, on the other hand they strengthen the market power of incumbents, raising other anticompetitive issues, as indicated by the multimarket contact theory.

Also the achievements of the second and third pillar of the European electricity policy present some problems. In order to maintain the internal security of supply, the expected growing demand for electricity needs to be encountered with new investments in generation capacity (Finon, 2006). Moreover, as indicated by the third pillar, additional generation capacity should come by new green energy investments. Both of these goals at the present do not meet the expected results.

In sum, while the trend of concentration is increasing, the internal market is still far from being completed. A new European policy is needed in order to create incentives to invest, particularly in interconnection infrastructures to connect the different regional and national wholesale markets. The existing interconnection infrastructures in fact do not guarantee the limitation of possible anticompetitive effects deriving from concentration in national markets (Jamasb and Pollitt, 2005).

The completion of the internal market will solve most of problems present in the electricity sector. It will enhance competition, reducing the risk of market abuse and future collusion. Investments in interconnection are hence the key solution in limiting most of the present and future risks for competition. Moreover, they will guarantee that future mergers and acquisitions will be mainly addressed for economical efficiency reasons and not only in order to exploit market power. In addition, also the security of supply will be enhanced thanks to the creation of the internal market. There are different reasons for high price levels such as fuel costs, the need for investments, the

development of renewable energy sources, and new environmental obligations. A better implementation of the internal market can ensure an open and competitive industry with the best prices for final consumers. Nevertheless this implementation is still far from provisions.

Technology will play an important role in the future. New discoveries coupled with increasing quotas of green energy will bring in the market new players and will lead to new investments in innovation. The policy of regulatory authorities needs to be reinforced to stimulate these changes.²²

Another interesting remark can be derived from a broader strategy of big European incumbents. They are in fact spreading their interests toward different markets and new geographical areas, toward the creation of giant multiutilities. Companies such as Suez, Endesa, EDF, RWE, and E.ON. are diversifying their business toward gas, electricity, water, waste and communications services. EDF is active on the energy and waste businesses, Endesa in the energy and communication services and Enel in the electricity and gas businesses. This trend of diversification by utilities will continue in the future, raising other concerns about multimarket contacts and the risk of collusion.

This framework shows that liberalisation and integration in Europe represents a discovery process, with continuous interactions between market players and regulatory authorities.²³ The change in the industry structure coupled with an effective implementation of the European directives in the near future will lead to new dynamic interactions and challenges in the electricity sector.

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²²Different mechanisms exist to stimulate innovation and green energy, nevertheless they are still marginal. One example is represented by the feed-in tariffs (Jacobsson and Lauber, 2006).

²³Some authors argue that to achieve the internal market, a third package of directives will be needed.