

# Electric energy restructuring in the European Union: Integration, subsidiarity and the challenge of harmonization

Roberto J. Serrallés

*Department of Geography, University of Oregon, Eugene, OR 97403, USA*

Available online 13 June 2005

## Abstract

In 1996, the European Union (EU) instituted Directive 96/92/EC that aims to establish a competitive, secure and transparent EU-wide internal electric energy market. The process of electricity market restructuring in the EU is being guided primarily by the principle of subsidiarity. As an organizational concept, the principle of subsidiarity allows Member States to establish their own implementation strategies and methods as a means of achieving the EU-mandated goal of electric energy restructuring. Historically, the structure of the electric energy industry in place among the Member States exhibited widely disparate organizational and functional characteristics with regard to ownership, control and regulation. Under these varied and contrasting political and economic conditions, the goal of a EU-wide harmonized electric energy market becomes very challenging. In this paper, I describe the policy mechanisms and the market conditions mandated by the EU directive aimed at liberalizing the electric energy market. I then assess the role of political culture, historical resource endowment and geographical conditions in the utility restructuring strategies of some key Member States and its effects on the overall goals of a harmonized internal electric energy market. Finally, I argue that European electric energy restructuring must be understood within the context of the political and economic milieu that spawned the individual Member States' electric energy industry.

© 2004 Elsevier Ltd. All rights reserved.

## 1. Introduction and background

The process of European integration and the emergence of the European Union (EU) have dramatically altered the political and economic landscape of Western Europe (Map 1). The formation of a European single market in 1987 required that EU Member States remove physical, legal and fiscal barriers to the free movement of goods, services, capital and labor within the EU (EU, Single Europe Act, Luxembourg, 2/1987). The requirements of the Single Europe Act (SEA) mandated, among other things, the abolishment of tariffs, an end to protectionism and the termination of state-run monopolies. Of all the economic sectors enjoying some form of state-sanctioned monopolistic protection, the energy sector, and specifically the electric energy sector, has been the last one forced to liberalize.

### 1.1. European electric energy industry prior to liberalization

From the post-WWII era until the late-1980s, European states supported the formation of vertically integrated, publicly or privately owned monopolies that were franchised to operate the generation, transmission and/or distribution networks of an entire geographical region or, in some cases, an entire country (Table 1). Since generation, transmission and distribution networks for electric energy are complex and extremely capital-intensive enterprises, establishing and maintaining these networks required substantial governmental financial support and guarantees as well as logistical coordination. Two main reasons stand out for the strength of these monopolistic entities and the consequent delay in the liberalization of the electric energy sector: security of supply and commodity complexity. First, the electric energy sector has been traditionally considered as a vital component of all European states'

*E-mail address:* bertoad@darkwing.uoregon.edu (R.J. Serrallés).



Map 1. The European Union.

Table 1  
Organization and structure of electric energy industry in selected member states prior to liberalization (before 1989)

	Primary fuel choice	Ownership	Geographical scope	Vertically integrated
France	Nuclear	Public	National	Fully
Netherlands	Gas and coal	Public	Regional and local	Partly
Spain	Coal and nuclear	Public	Regional	Mostly
United Kingdom	Coal and nuclear	Public	National and regional	Partly
Norway	Hydro	Public	National, regional and local	Partly
Sweden	Hydro and nuclear	Public and private	National, regional and local	Mostly
Denmark	Coal and gas	Public and private	National, regional and local	Partly
Finland	Nuclear and coal	Public and private	National, regional and local	Mostly
Germany	Coal and nuclear	Public and private	Regional and local	Fully and partly

Source: Midttun (1997); IEA (2000).

economic and political security, especially during the post-WWII period. Seeking to establish an uninterrupted and reliable supply of electric energy for reconstruction and for the continued economic development, European states came to regard the electric energy sector as a government-subsidized service sector.

Another factor encouraging a monopolistic organization of the electric energy sector stems from the complexities involved in managing reliably a large electric load over a given distribution network so that any entity, be it commercial or residential, has on-demand, 24 h access to electricity the year round. In addition, the inherent uniqueness of electricity as a commodity reinforces the perceived necessity for state-sponsored monopolistic orga-

nization of the electric energy sector. Since electricity cannot be viably stored in substantial quantities and thus has no “shelf-life”, matching demand and supply requires that idle generation capacity be available for short intervals of peak demand. This leads to economic inefficiencies that are subsidized by the state for the sake of system stability, reliability and the politically sensitive perception of stable and low electricity costs.

The close association of Europe’s state-supported electric energy utilities with their respective national governments led to a variety of organizational and functional conditions that have become political and economic obstacles to the European goal of a liberalized electric energy market (Haugland et al.,

1998). Organizationally speaking, due to the high degree of state support of their economic operations, European electric energy utilities did not need to operate in the most cost-effective and efficient manner. Oversized installed generation capacities, low incentive for technological innovation and cumbersome corporate bureaucracies have characterized many European electric energy providers. This condition has left most European utilities ill-prepared to compete in a liberalized electricity market. Also, as national service providers, electric energy companies operated exclusively within the country's political boundaries. Infrastructure and service plans were geared towards the internal national territory and interconnections to other country's networks were, on the whole, weak and uncoordinated.

Functionally speaking, since security of supply was a high priority, fuel choices for generation stations were often made with the goal of exploiting a local resource regardless of the comparative cost of such fuel as opposed to cheaper alternatives. National industrial and political priorities influenced energy policy decisions in the post-WWII era and consequently electric energy utilities became subservient to a set of priorities unrelated to efficient electricity production (McGowan, 1996). For example, in places like the UK, Germany and Spain, thermal electric generation plants were designed and encouraged to utilize locally available coal. This coupling of energy policy and protectionist industrial policy limited the ability of many European electric energy utilities to diversify their fuel portfolios and adversely affected their competitive position in a future internal electric market. Finally, European electric energy utilities have been tied to long-term planning horizons and have developed an over-reliance on forecasting as a tool for policy and economic planning, which has limited their operational and corporate flexibility (Baumgartner and Midttun, 1987).

## 2. Challenges to the natural monopoly model

By the early 1980s a variety of political, environmental and technological influences began to exert significant pressure for reform of the European electric energy sector. Politically speaking, along with the general movement toward European integration, the growing influence of neo-liberal economic ideologies began to assert pressure on the static and monopolistic European electric energy industry. Best expressed by Thatcherism in the UK and Reaganomics in the USA, the neo-liberal economic goals of liberalization of markets, which are to be achieved through the introduction of competition, the privatization of state industries and the deregulation of key industrial sectors, offered a strong alternative to what was popularly viewed as a cumbersome, bureaucratic and inefficient centralized electric energy industry.

The development of more efficient generation technologies and advances in telecommunication technology accelerated the prospects for meaningful liberalization in the electric energy industry. The most significant technological development of the last two decades was the emergence of the combined cycle gas turbine (CCGT). As CCGT's became more efficient and reliable, they provided utilities and private electric energy generators with a smaller, less capital-intensive alternative that could more quickly match capacity with expected load demands (McGowan, 1996). The advent of CCGTs allowed utilities to shorten their investment and planning horizons, a condition that prepared them for a competitive electric energy market. Finally, advances in telecommunications technology provided the electric energy industry tools to efficiently monitor network loads, to accurately meter flows through transmission and distribution networks and to improve efficiency through energy management systems (McGowan, 1996).

Environmental considerations gained considerable influence in European energy policy circles during the last three decades, mainly in response to concerns over the safety of nuclear power, security of energy supplies following the oil shocks of the late 1970s and the more recent threat of rising CO<sub>2</sub> emissions and their potentially dire global climatic effects. Overall, the rise of environmentalism has forced European governments and the electric energy companies to seek more efficient and more environmentally benign alternatives to nuclear energy and fossil-fuel burning thermal plants. With electric energy currently responsible for almost 35% of global CO<sub>2</sub> emissions (IPCC, 2001), the EU and the member states have established ambitious emissions-reduction goals to comply with Kyoto commitments. These policy goals, coupled with technological advances in renewable energy generation, particularly wind energy, have resulted in the expansion of the installed capacity of electric renewable energy generation in the EU from <1% in 1990 to 2.9% in 2002 (Eurelectric, 2003).

Taken together, the environmental, technological and political challenges to the state-supported utility monopoly model have had a tremendous effect on the electric energy industry in the EU by requiring the necessary infusion of private investments into the generation sector, by encouraging innovation, efficiency and competition, and finally by promoting the expansion of electric energy generators to include non-utility, private entities.

## 3. European single energy market (SEM)

In, the EU instituted Directive 96/92/EC, 1996 that aims to establish a competitive, secure and transparent EU-wide internal electric energy market. The stated goals of the single electricity market (SEM) are to



“increase efficiency in the production, transmission and distribution of this product [electricity], while reinforcing security of supply and the competitiveness of the European economy and respecting environmental protection”(EU, Directive 96/92/EC, Preamble 4). The guiding principle of the Single Electricity Market is competition. As the cornerstone of the efforts to liberalize the European electric energy industry, competition is expected to force generators and distributors to become more innovative, flexible and efficient in the production and procurement of electricity and its related services. The EU anticipates that competition will result in a reduction in prices both for industrial and residential consumers while at the same time increasing the quality of service and fostering a more efficient use of natural resources. While too early to tell, average EU electricity prices have dropped over the last three years, although some Member States have witnessed increases in electricity prices. In addition, the directive highlights three economic conditions that must be achieved as a prerequisite to a competitive market: consumer choice, third party access (TPA) and unbundling.

### 3.1. Market conditions necessary to achieve the SEM

The transition from a highly regulated, state-supported monopoly to a transparent competitive market in electricity must occur incrementally and under the guidance of carefully crafted parameters. The EU identified three key market conditions that are necessary to develop a fair and competitive market in electricity: consumer choice, third-party access (TPA) and unbundling of key assets.

#### 3.1.1. Consumer choice

For a competitive market to function effectively, consumer must be able to freely choose their electric energy supplier. The SEM sets out tiered target dates by which Member States agree to progressively offer choice to medium and small consumers. Large-sized consumers (> 100 GWh/yr) must be able to choose their supplier by the first target date, 19 February 1999. For medium-sized consumers (> 40 GWh/yr) the directive sets a target date of 19 February 2003 by which the majority must have choice. Specifically, the minimum requirements mandated by the EU for Member States are as follows:

- by 19 February 1999, 26% of electricity demand must have choice.
- by 19 February 2000, 28% of electricity demand must have choice.
- by 19 February 2003, 33% of electricity demand must have choice.

As of April 2003, all Member States have complied with these minimum requirements (EU, European

Commission SEC (2003) 448). While two Member States, France and Greece, have only 34% of their electricity market open to choice, others like the UK, Germany, Austria and Spain offer choice to 100% of their electric energy consumers. The Nordic bloc comprising of Sweden and Finland (and Norway, a non-EU member) have had a liberalized electric energy market since 1996 under the regulation of NordPool and thus offer choice to 100% of their electric energy consumers.

#### 3.1.2. Third party access (TPA)

A key component of a free and competitive electricity market is access to both transmission and distribution networks. Akin to a road system, electricity generators must be able to utilize the high-voltage transmission lines (interstate highways) and medium-and low-voltage distribution networks (secondary and tertiary roads) to deliver electricity (goods) to consumers throughout the country and, for that matter, throughout the EU. Equal access to the transmission and distribution networks, known as TPA, constitutes one of the more challenging aspects of a transition to a liberalized electric energy market.

First, transmission networks traditionally built and managed by vertically integrated, state-supported electric energy monopolies are generally located between large load centers (cities and large towns) and the large generation plants. Therefore, geographically speaking, existing transmission networks limit the locational choices of new private generation facilities. This creates a physical barrier to competition. The expansion of these networks involves capital-intensive endeavors that only the state can bankroll. Second, the issue of “stranded costs”, both in terms of their valuation and their recuperation, becomes politically and economically problematic. Stranded costs refer to capital investments made by the state through a state-supported utility that have yet to be recuperated. Therefore, as transmission networks become unbundled from generation companies, these debts become unrecoverable and negatively affect the financial position of these companies. Yet, the formula by which to calculate these stranded costs and the methods used to allocate these stranded investments become politically charged as previously vertically integrated companies are bound to receive compensation from the state thus reflecting negatively on the country’s perceived competitive landscape.

The SEM directive outlines two possible routes for Member States to organize access to the transmission and distribution networks and thus guarantee TPA. A Member State may choose either a *negotiated* third party access system or a *regulated* third party access system. In a negotiated system there is access to the transmission and distribution networks and generators negotiate rates directly with retailers. Under a regulated system, Member States give “eligible customers a right

of access, on the basis of published tariffs for the use of transmission and distribution systems” (EU, Directive 96/92/EC, Article 17.4). Although the directive provides Member States choice in how to organize access to the transmission and distribution networks, the EU expects and encourages Member States to choose a regulated access system. Quite simply, regulated access is the most transparent and the most likely system to guarantee non-discriminatory access. Currently, the only Member State using a negotiated TPA is Germany.

### 3.1.3. Unbundling of networks

Aside from guaranteeing unhampered access to transmission and distribution networks, the SEM directive requires that these networks be unbundled from the generation and retail businesses of vertically integrated utilities. The directive allows for two alternative arrangements for unbundling of these assets. First, a Member State may choose to create an independent entity, either legally or through separate ownership, known as the transmission system operator (TSO) or in some cases a distribution system operator (DSO) whose sole purpose is to manage, maintain and operate the networks. Most Member States have chosen this arrangement. The other alternative permitted under the SEM directive allows vertically integrated utilities to separate both the management and accounting of the TSO/DSO from the generation and its other commercial activities. If this approach is followed, the directive requires a set of safeguards be placed for the protection of confidential or sensitive commercial information of the users of the TSO/DSO.

## 4. Mechanisms for transition

In line with the overall project of European integration, the creation of a SEM is guided by a set of mutually agreed policy principles that define the peculiarity of EU federalism. One of the more unique and important of these principles in the context of the creation of the SEM is the principle of subsidiarity.

### 4.1. Subsidiarity

The principle of subsidiarity is outlined in the Treaty of EU and it is one of the cornerstones of the EU's style of federalism. By limiting the Community's scope of action to issues that cannot be addressed at the Member State level, subsidiarity provides a significant amount of leeway for Member States to achieve the goals of the EU. Article 3b states that “in areas which do not fall within its exclusive competence, the Community shall take action, in accordance with the principle of subsidiarity, only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by

the Member States and can therefore ... be better achieved by the Community” (EU, Treaty of European Union, Maastricht, 12/1991 Article 3b).

The technical complexity of the electric energy market and the inherent peculiarity of electricity as a commodity require a certain level of centralized control and regulation. As the geographic scope of the electricity market expands, so does the need for technical oversight and harmonization. By definition, the principle of subsidiarity involves enough flexibility of action that as an operating concept it may not be entirely adequate to organize the transition toward a SEM. Yet, the SEM directive is quite explicit in its support of subsidiarity as the organizing concept in the transition to a European electricity market. Specifically, the directive states that “... in accordance with the principle of subsidiarity, general principles providing for a framework must be established at the Community level, but their detailed implementation should be left to Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation” (EU, Directive 96/92/EC, Preamble 11).

In fact, several Member States (Belgium, Ireland and Greece) were given extensions to the deadline for opening up their market to competition (Belgium and Ireland later chose to meet the deadline). While this level of flexibility threatens to create a “multi-track” road to the SEM, a process in which the electric energy markets open at different speeds, the EU allowed the SEM directive to provide generators in markets that open before the set deadlines protection from generators in “protected” markets. The majority of Member States incorporated this “protection clause” into their energy liberalization legislation and can thus temporarily exclude generators from non-competitive or protected markets from selling electricity in their liberalized national market.

Accommodating the Member States' contrasting set of implementation strategies and priorities offers a distinctive challenge to some of the other stated goals of the SEM. In addition to a competitive and transparent electricity market, the EU recognizes the public service imperative associated with a reliable supply of electric energy. The SEM directive states that “for some Member States the imposition of public service obligations may be necessary to ensure security of supply and consumer and environmental protection” (EU, Directive 96/92/EC, Preamble 13). However, there is concern over the type of regulatory regime necessary to safeguard the potentially different public service obligations required by the EU Member States.

### 4.2. Integration: trans European energy networks and the Florence Process

The project of European economic integration has been sensitive to regional economic disparities. In 2002,

approximately 35% of the EU budget was earmarked for structural and cohesion funds (EU Budget 2002/EC). The main objective of these funds is to harmonize the infrastructure of Member States and thus minimize obstacles to the development of a fair, competitive and integrated single market in the EU. Among the biggest challenges facing the establishment of the SEM involves the physical integration of Member States' electric energy networks. For a true European-wide market for electricity to emerge, the task of harmonizing the Member States' electric energy infrastructure into a single network is perhaps more challenging than the task of liberalizing their respective national electricity markets (IEA, 1999). In response to these concerns and to facilitate the process of integration, the EU has identified intra-Member State electricity network bottlenecks and weaknesses. These infrastructure problems, which clearly fall under the competence of the EU, are the focus of a new funding program for the development of Trans-European Energy Networks (TEEN) (Map 2). In 2002, the EU spent over € 680 million in TEEN projects (1% of total budget) (EU Budget 2002/EC).

Yet, while an adequate electricity infrastructure is essential for the future of the proper functioning of the SEM, a trading system between all the national networks still needs to be conceptualized and created. In 2000, the EU developed the "Florence Process", a program whose main goal is to "achieve a simple, objective, transparent, non-discriminatory trading system reflecting costs in order to create a real internal energy market" (EU, European Council COM(2000) 297 final). The principle mechanisms promoted to achieve this goal are the establishment of "non-discriminatory cross-border transmission pricing" and an effective "congestion management system" (EU, European Council COM(2000) 297 final). Therefore, the "Florence Process" will bring together group of stakeholders representing the EU, the Member States, the Council of European Regulators, the Association of European Transmission System Operators (ETSO) as well as generators and consumers as a means of developing the underlying structure for a future European electricity trading system.

## 5. Selected EU Member States' reaction

While the development of the SEM began in earnest in 1996, Member States have been pursuing the goal of an internal market in electricity with different approaches and different timetables (Table 2). A closer look at how some key member states, namely the United Kingdom, France and Spain, have approached the advent of the SEM underscores the challenges facing the goal of a harmonized, EU-wide electric energy market. In addition, the implementation strategies and outcomes in terms of ownership, control and regulation

that have emerged during these Member States' transition to the SEM highlight the influence of traditional economic conditions and political culture on the process of market liberalization.

### 5.1. United Kingdom

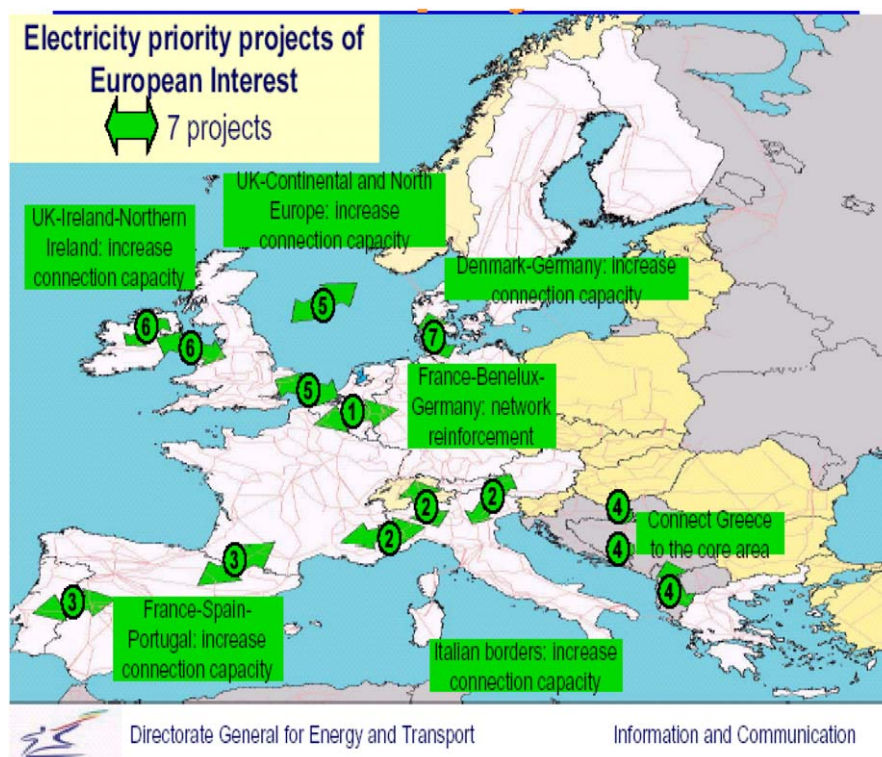
The rise of Thatcherism in the 1980s and its embrace of neoliberal economic objectives resulted in some of the earliest efforts to privatize and liberalize utilities among members of the EU. The UK electricity market began the process of liberalization as a result of the Electricity Act of 1989 and achieved 100% liberalization by 1999. Quite similar to the SEM directive in terms of its requirements of competition, TPA and unbundling, the Electricity Act propelled the UK as a leader in utility liberalization thus becoming one of the first Member States ruled in compliance with the SEM directive.

The UK electricity market actually consists of three separate regional markets: England and Wales, Scotland and Northern Ireland. Both England and Wales and Scotland markets are 100% liberalized and permit regulated TPA. Generation in England and Wales consists of approximately 20 private entities, but the market is dominated by Innogy—formerly National Power and now RWE AG—(21% of market), British Energy (18% of market), and PowerGen (17% of market). In Scotland, generation is dominated by two vertically integrated utilities: ScottishPower and Scottish and Southern Energy Group (SSEG) which together account for 98% of the generated capacity in Scotland. Both ScottishPower and SSEG participate in the electricity market of England, Wales and Northern Ireland. The Northern Ireland market has been following the minimum requirements of the SEM directive and is expected to be 100% liberalized by 2005. Generation in Northern Ireland is dominated by four private generation companies with some Irish generators entering the market in tandem with the market's liberalization.

The transmission network in England and Wales is owned and operated by National Grid Transco, an independent, private company that offers regulated TPA. In Scotland, both Scottish Power and SSEG have separated their transmission assets under independent management and accounting. In Northern Ireland, transmission and distribution networks are owned and operated by Northern Ireland Electricity—now Viridian, a publicly owned company. Among the priority projects for TEEN is the creation of a strong interconnection between Northern Ireland, Great Britain and the Republic of Ireland.

Being one of the global leaders in electric energy market liberalization, the new economic landscape in the UK has facilitated the transition toward competition





Source: DG XVII - The Directorate General for Energy and Transport

Map 2. Trans-European Energy Networks—Priority projects in electricity.

Table 2  
Implementation of the Electricity Directive

	Market opening (%)	Full opening date	Unbundling of TSO	Unbundling of DSO	Third Party Access	Biggest three generators share of capacity (%)
Austria	100	2001	Legal	Accounting	Regulated	45
Belgium	52	2003/7	Legal	Legal	Regulated	96 (2)
Denmark	100	2003	Legal	Legal	Regulated	78
Finland	100	1997	Ownership	Management	Regulated	45
France	34	2007 <sup>a</sup>	Management	Accounting	Regulated	92
Germany	100	1999	Legal	Accounting	Negotiated	64
Greece	34	2007 <sup>a</sup>	Legal	Accounting	Regulated	97 (1)
Ireland	56	2005	Legal	Management	Regulated	97 (1)
Italy	70	2007 <sup>a</sup>	Own	Legal	Regulated	69
Luxembourg	57	2007 <sup>a</sup>	Management	Accounting	Regulated	NA
Netherlands	63	2003	Ownership	Management	Regulated	59
Portugal	45	2003	Legal	Accounting	Regulated	82
Spain	100	1998	Ownership	Legal	Regulated	83
Sweden	100	1998	Ownership	Legal	Regulated	90
UK	100	1999	Ownership	Legal	Regulated	36

<sup>a</sup>Source: EU, European Commission SEC(2003) 448 expected, not legislated. ( ), number of generators if less than three.

of its large energy companies. After almost 10 years of operating in a liberalized market, British utilities have witnessed an intense period of mergers, vertical re-integration, diversification and internationalization in the electric energy sectors. For example, National Grid Transco, Scottish Power and PowerGen have expanded

their assets to liberalizing markets in Europe and the USA. Others, like Innogy, formerly National Power (a public utility prior to privatization), have been absorbed by larger European energy players in a process of energy agglomeration. Most of these changes could not have been predicted in the mid-1980s, but the evolving

conditions of the UK market helps foreshadow the trends and arrangements that may become visible in other national and international liberalized markets (Young, 2001). Therefore, the emerging outcomes of liberalization of the UK electric energy market in terms of ownership and control reflect a traditional economic and political culture that is outward-looking in terms of seeking advantage for UK enterprises in the global economic landscape.

## 5.2. France

The French national government has a strong traditional relationship with its energy industry. The primary electric utility, *Electricité de France* (EDF), is a vertically integrated public company formed through a process of nationalization of the electric energy industry by the law of 20 April 1946. EDF is responsible for approximately 75% of the generation capacity (mostly nuclear) in France, while the *Compagnie Nationale du Rhône* (CNR), also a publicly owned company, controls 15% of the generation capacity (exclusively hydro-electric) in France. In 2001 CNR created *Energie du Rhône* (EDR) as a joint venture with Electrabel, the former Belgian national utility, to distribute and retail the electricity CNR produces in France.

The development of EDF as Europe's single largest electric energy company emerged from a traditional French political economy that dictated a national command and control economic system. This economic approach was particularly evident in energy sector and was in part due to the poor condition of France's energy resource base. France is by far the world's largest generator of nuclear electricity. The large role of nuclear electric energy in France's energy mix provides some specific advantages and challenges to its ability to integrate into the SEM.

On the one hand, the large installed nuclear capacity and the reliable manageability of nuclear electric energy has made France a large electric energy net exporter. Electricity interconnections between France and its neighboring states have developed in response to France's condition as a net exporter of electricity and are therefore more robust and mature than most interconnections between Member States (with the possible exception of the NordPool). Currently, France has contracts for electricity exports with Italy, Switzerland, Spain, Germany, Belgium and the UK (Office of Nuclear Affairs, France, 2002). The experience as a net exporter and the strength of the interconnection infrastructure offers EDF a significant benefit as it operates in the SEM. Also, nuclear energy qualifies as a zero-emission (CO<sub>2</sub>) fuel in the context of Kyoto Protocol obligations, and therefore France has an advantage in meeting its environmental obligations towards the SEM and the EU.

On the other hand, nuclear energy is extremely capital intensive, not only in the construction of nuclear reactors, but also in the treatment and disposal of radioactive waste. As such, it is argued that EDF would never have been able to achieve its nuclear energy position without the direct involvement of the state. In fact, serious questions exist about the future role of the state with regard to the costs associated with the treatment and disposal of nuclear waste and its potential distortion of competition in the SEM. The allocation and financing of EDF's stranded costs is the topic of intense negotiations and an acceptable solution has yet to be formulated.

France has opened up the electric energy consumer market to choice but only in compliance with the minimum requirements under the SEM directive. The state's reluctance to privatize EDF hampers the development of a transparent and non-discriminatory electricity market in France. Although new private generators have been given access to the French market, EDF still owns and controls the majority of generation as well as the transmission and distribution networks. In fact, of all the conditions presented in the SEM directive, France originally was vigorous in its opposition to TPA. France attempted unsuccessfully to modify the TPA requirement under the SEM directive to give an advantage to domestic electricity in its distribution rate scheme (Matlary, 1999).

## 5.3. Spain

Following the end of the Franco regime in 1975, Spain quickly emerged from relative economic and political isolation in a process that culminated with it joining the EU (then EEC) in 1986. Although Spain witnessed a remarkable liberalization of many of its industrial sectors during this period, in 1986 Spain's energy sector still bore the stamp of its autarkic past. Developed during the Franco regime's attempt to be industrially self-sufficient, Spain's three main surviving electric energy companies, ENDESA, Iberdrola and Union Fenosa, developed their generation capacity around indigenous fuels like coal and hydro. In fact, until 1986, Spanish thermal generators were required to buy Spanish coal for their operations even though imported coal was cheaper and cleaner. Subsidies for the Spanish coal industry were finally phased out in 1998 after protracted negotiations with the EU. The state's protective behavior of "Spanish" economic enterprises permeates the character of the liberalization legislation and it has influenced some of the outcomes in terms of corporate ownership and control.

The first law to establish a process for the liberalization of the Spanish electric energy market was Law 40/1994 of December 30 (known by its Spanish acronym LOSEN). Specifically, the LOSEN mandated the legal unbundling



of the transmission network and created an independent joint public–private TSO called Red *Eléctrica Española* (REE). REE offers regulated TPA to both the transmission network and the distribution network. Due to the lack of transmission congestion in Spain, the TSO has adopted what is known as a “postage stamp” tariff or geographically uniform tariff. This type of tariff uses a flat rate dependent on voltage and use of network (IEA, 1999). In so far as generation, the LOSEN was quite permissive in terms of the maximum market share that any given Spanish generating company could control. Therefore, the period between 1994 and 1997 saw an acceleration of the trend toward consolidation that started in 1990 in the electricity generation sector. From over 35 independent regional generation companies in operation in 1990, only five were left by 2002 (UNESA, 2003). Of those five, the market is overwhelmingly controlled by the three largest companies—ENDESA, Iberdrola and Union Fenosa—which together account for 83% of the generation installed capacity (EU, European Commission SEC(2003) 448). The LOSEN was superseded by Law 54/1997 of November 27, which accelerated the process of liberalization by setting a timetable for liberalization. Currently, 100% of electric energy consumers in Spain are able to choose their electricity supplier.

When discussing the outcomes of liberalization of the electric energy market in Spain, one must understand Spain's transition to a liberalized energy market as a product of a distinctly Spanish political culture that is committed to the project of European integration yet is remarkably protective of Spanish enterprises in the face of European competition. One of the most interesting outcomes of electricity liberalization in Spain has been the emergence of three giant, diversified and internationalized “energy” companies. Helped in part by the protective assistance of the Spanish state during the 1990–1997 period, ENDESA, Iberdrola and Union Fenosa consolidated enough generation assets to elevate their competitive stature against the expected post-liberalization European competition. The international operations of these companies are now extensive with generation and distribution operations in North, Central and South America as well as in Africa, Asia and other parts of Europe. Expanding their business activities, these three companies have diversified into “non-core” areas of business like telecommunications, real estate and construction. Finally, all three companies have made trans-utility acquisitions of gas distribution assets and mining operations.

## 6. Conclusion

The most salient short-term outcomes of the liberalization of the electric energy market in the EU has been

the consolidation of energy companies in the national markets. The decreasing numbers of companies engaged in national markets has led to a perception of decreased competition in these markets. Yet, while the total number of energy companies in practically every market in the EU has decreased, the trend seems to involve the merging of smaller, regionally based energy companies into larger national and international energy companies. Supporters of liberalization claim that this trend is a natural process of increasing efficiencies and synergies through agglomeration, while critics warn of the dangers of concentrating so much power into the hands of few giant national energy companies. A key question that needs further consideration is: how many entities are necessary in the electric energy market to have “healthy” competition? And looking at the prospect of EU enlargement, geographical limitations to a SEM will need to be addressed for the sake of system stability.

A parallel trend in most countries is the increase in very small (one or two generating facilities) private generators that are utilizing efficient CCGT and other co-generation technologies. These lean companies put some pressure on the large energy companies to become more efficient or to offer better service. In fact, with the open market in generation and the lack of “branding” of electrons, large energy companies are becoming service companies. Therefore, a higher quality of service as well as national affiliation with a “local” or “national” provider might prove to be critical aspect in terms of customer-base retention and expansion.

One of the most unique aspects of the process of liberalization of the electric energy sector in the EU is the degree of autonomy that Member States wield in their attempt to liberalize their own electric energy markets, and in doing so, structure the character of an European-wide SEM. Although the process is being guided by EU-wide principles, the different policy approaches undertaken by the Member States seriously threaten to establish a geographically uneven playing field where competition will continue to be dominated by regionally entrenched “national” energy companies. Of particular importance is the locational advantage that the existing internal transmission networks provides to established national electricity generators. So, while the EU is focusing attention on trans-European transmission upgrades, a similar policy for expanding the geographical scope of national transmission networks would facilitate competition in national markets and aid the expansion of renewable electric energy projects.

Another distinctive aspect of liberalization in the EU electricity market is the attempt to balance public service imperatives within a competitive market structure. The “social obligations” aspect of the directive provides a counterbalance to free-market orthodoxy by establishing public service standards that guarantee a basic level

of access to electricity. This set of conditions highlight the role of an emerging EU political culture that embraces the concept of free-markets yet seeks to control and mold the market's *structure* so that social and environmental safeguards are guaranteed while at the same time providing enough flexibility so that EU federalism is protected (Young, 2001).

Finally, while the SEM directive is explicit in terms of the market structure that needs to be in place for a competitive electric energy market to flourish in the EU, the directive is not clear on the type of regulation that a future EU electricity market will require. Although the first attempts have been made to articulate a regulatory scheme through the “Florence Process”, this critical component of restructuring is not yet determined. Therefore, while national markets are liberalized based on EU-mandated conditions, the regulation of the national markets is occurring with different approaches based on the decisions enacted at the Member State level. Therefore, it is imperative that the EU harmonize the different regulatory regimes in place in each of the national markets as it attempts to establish a single regulatory regime for the EU-wide SEM.

## References

- Baumgartner, T., Midttun, A. (Eds.), 1987. *The Politics of Energy Forecasting*. Clarendon Press, Oxford.
- Eurelectric, 2003. Union of the Electricity Industry, Brussels, Belgium. <<http://www.eurelectric.org/>>
- European Union, 1987. Single Europe Act, Luxembourg, 2/1987.
- European Union, 1991. Treaty of European Union, Maastricht, 12/1991.
- European Union, 1996. Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity.
- European Union, 2000. European Council, COM(2000) 297 final. Recent progress with building the internal electricity market.
- European Union, 2002. European Commission, Budget 2002. <[http://europa.eu.int/comm/budget/pubfin/index\\_en.htm](http://europa.eu.int/comm/budget/pubfin/index_en.htm)>
- European Union, 2003. European Commission, SEC(2003) 448. Second Benchmarking Report on the Implementation of the Internal Electricity and Gas Market—Updated 4/2003.
- Haugland, T., Bergesen, H.O., Roland, K., 1998. *Energy Structures and Environmental Futures*. Oxford University Press, Oxford.
- IEA—International Energy Agency, 1999. *Energy Policies of IEA Countries—1999 Review*. OECD, Paris.
- IEA—International Energy Agency, 2000. *Energy Policies of IEA Countries—2000 Review*. OECD, Paris.
- IPCC—Intergovernmental Panel on Climate Change, 2001. In: Watson, R.T. (Ed.), *Climate Change Synthesis Report*. Cambridge University Press, New York.
- Matlary, J.H., 1997. *Energy Policy in the European Union*. St. Martin's Press, New York.
- McGowan, F. (Ed.), 1996. *European Energy Policies in a Changing Environment*. Physica-Verlag, Heidelberg.
- Midttun, A. (Ed.), 1997. *European Electricity Systems in Transition*. Elsevier, London.
- Office of Nuclear Affairs, Government of France, 2002. <<http://www.info-france-usa.org/intheus/nuclear/profile/introduc/results.asp>>
- UNESA, 2003. Asociación Española de la Industria Eléctrica (UNESA). <<http://www.unesa.es/>>
- Young, A., 2001. *The Politics of Regulation*. Palgrave, London.

## Further reading

- European Union, 2001. European Commission SEC (2001) 1957. First Benchmarking Report on the Implementation of the Internal Electricity and Gas Market.
- European Union, 2002. European Commission, SEC(2002) 1038. Second Benchmarking Report on the Implementation of the Internal electricity and Gas Market.
- IEA—International Energy Agency, 1997. *Energy Policies of IEA Countries—1997 Review*. OECD, Paris.
- IEA—International Energy Agency, 1998. *Energy Policies of IEA Countries—1998 Review*. OECD, Paris.
- McCormick, J., 1996. *The European Union: Politics and Policies*. Westview Press, Boulder CO.
- Mez, L., Midttun, A., Thomas, S., 1997. *Restructuring Electricity Systems in Transition*. In: Midttun, A. (Ed.), *European Electricity Systems in Transition*. Elsevier, London.