COMPETITION IN THE CONTINENTAL EUROPEAN ELECTRICITY MARKET: DESPAIR OR WORK IN PROGRESS?

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Synopsis

This chapter examines the perspectives for competitive electricity markets in Continental Europe.

Abstract

In most Continental European countries restructuring of the electricity market started in the late 1990s and is still going on. The object of this chapter is to investigate past developments in this market and to analyze which conditions are necessary to enhance competition in the long run.

Currently, the major obstacle for one common European electricity market is a general lack of competition in virtually all local and national wholesale as well as retail electricity markets because the number of competitors is too low, or because barriers to entry and incentives to collude remain too high.

Our major conclusion is that several conditions are necessary to bring about effective competition in the Continental European electricity market: (i) a complete separation of ownership of the transmission grid and the generation and supply in all countries and sub-markets; (ii) sufficient transmission capacity for creating a larger market; (iii) adequate margins in generation capacity; (iv) a sufficiently large number of generators to share this capacity; (iv) a secure and competitive supply with primary fuels (notably natural gas). As it is not likely that these conditions will be fulfilled the prospects for a vibrant competition in Continental Europe are bleak.

1 INTRODUCTION

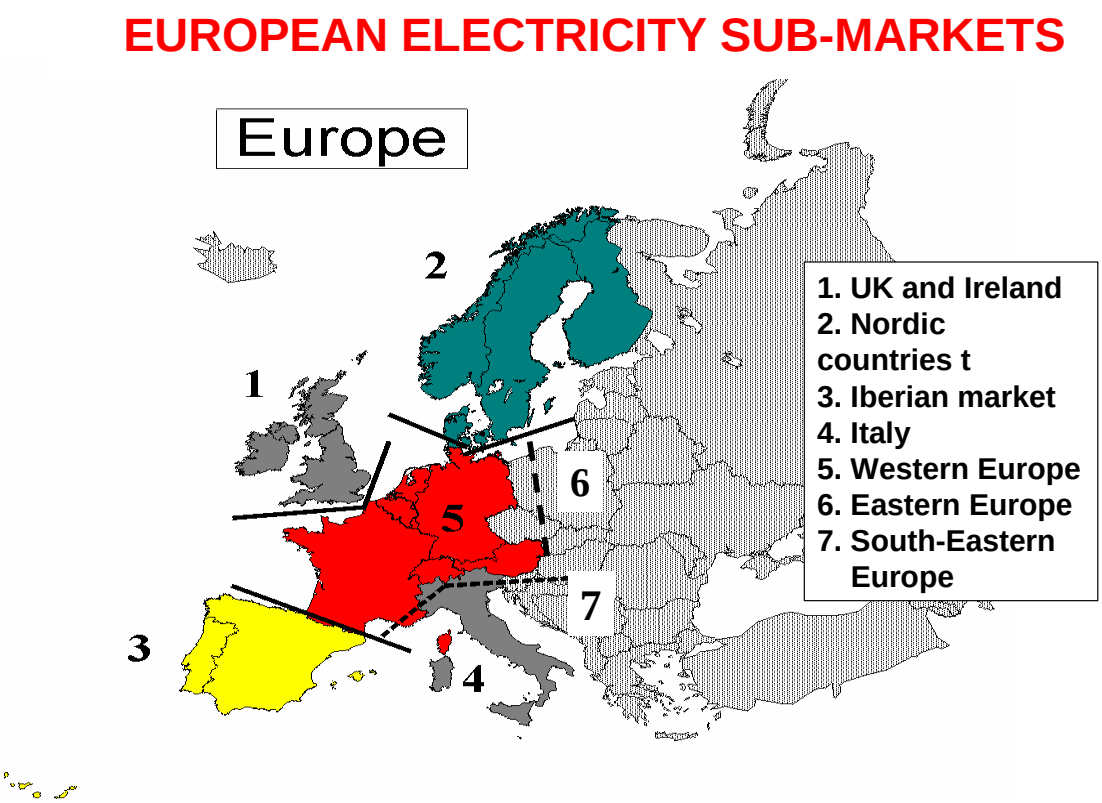
The restructuring of electricity markets in most Continental European (CE) countries started in the late 1990s, and, with the exception of Spain which initiated its own electricity pool in 1997, is still going on. This process was triggered by the European Commission directive, 1996(EC), "*Directive for a common electricity market*". The major motivation for this directive was the EC's conviction that liberalization, price deregulation and privatization would directly lead to competition in generating, as well as supply which would then result in lower prices for the whole of Europe.

The European Commission's main expectation in the directive was the belief that "*market forces [would] produce a better allocation of resources and greater effectiveness in the supply of services*"[1].

In June 1996, after years of discussion, the European Council of Energy Ministers reached an agreement with the European Parliament on a market liberalization directive, and six months later passed the full Directive Concerning Common Rules for the Internal Market in Electricity which, with the intention of restructuring the European power industry, became law in February 1997.

The initial intention of the European Commission was the creation of a common European electricity market, butthis area still consists of at least seven different sub-markets which are separated by insufficient transmission capacities, and differences in conditions for access to the grid (Fig. 1.1).

Figure 1.1. Electricity sub-markets in Europe in 2005



Furthermore "*The evidence from Europe and the US suggests that there are a number of conditions for successfully liberalising electricity markets.*" (Newbery (2002), Glachant & Finon (2003)). We have identified conditions which could bring about a common competitive European electricity market, thus leading to competitive electricity prices. They are:

- Access to the grid, this requires unbundling of generation from transmission, and of supply from distribution;
- Supply adequacy, adequate capacity in generation and transmission (TM) as well as access to primary energy sources (e.g. natural gas);
- Market structure, ownership and number of generators and suppliers;

[1] EC communication Services of general interest in Europe, OJ C 281, 26. September 1996, p.3.

- Design of the market place, notably the ease of entry for new players;
- Regulatory governance;
- Environmental issues, which are playing an increasingly important role.

The goal of this chapter is to analyze the evolution of the European electricity markets and to discuss future developments with respect to competition (See former treatments in Bergman et al (1999), de Paoli (2001), Glachant & Finon (2003), Politt &Jamasb (2005), Glachant & Lévêque (2005) as well as the special issue of the *Energy Journal* (2005)). This chapter covers most of what is currently called "Continental Europe" (CE): Austria, Belgium, Czech Republic, France, Germany, Hungary, Poland, Portugal, Slovenia, Slovakia, Spain, and Switzerland. It is organized as follows: Section 2 provides the historical context with major data and facts for the liberalization of the CE markets. Section 3 describes EC and national governments' market liberalization initiatives. Section 4 presents major changes country by country. Section 5 discusses the evolution of the markets corresponding to government initiatives. Section 6 describes the market's remaining problems; followed by conclusions in Section 7.

2 BACKGROUND: FACTS, FIGURES AND HISTORY

Before 1990, almost every electricity supply industry in Continental Europe was vertically integrated with a captive franchise market, either state-owned (the majority of cases) or under price-regulated mixed private/public ownership (as in Belgium, Germany and Switzerland) (see Chapter 1). Regulated area monopolies prevailed in all countries. Until the end of the 1990s, the standard model was "*an effectively vertically integrated franchise monopoly under either public ownership or cost-of-service regulation*" (Newbery (2006)).

Although electricity networks were typically synchronised over wide areas, interconnections of areas under different transmission system operators (TSOs) were frequently guided by security rather than economic considerations. However, most trade in the past was due to economic benefits of arbitrage during peak load hours.

Real electricity liberalization in Europe started with Britain's restructuring and privatisation in 1990, demonstrating that vertical unbundling and the creation of wholesale electricity markets was actually feasible (see Newbery (2006)). Jamasb and Pollitt (2005) argue that the centralised approach to market liberalization because of European Electricity Directives has succeeded in maintaining the pace of reform in the original EU-15, and in a number of associated and accession countries, and, as well as achieving a certain degree of standardisation of structures, institutions, and rules in national markets. However, the problems created by initially concentrated market structures have been reinforced by a wave of subsequent mergers, and the low level of interconnection that reduces the scope for fostering competition by imports (Glachant & Lévêque (2005)).

Yet, ownership structures and degree of vertical integration were quite different among the following countries.

- In France, Italy, Portugal, the former Czech-Slovak Republic, Poland, Hungary, and Slovenia a strong state-owned vertically integrated monopoly dominated the ESI. This centralized structure typically led to a single dominant player, such as *Electricité de France*;
- In Spain and Switzerland, vertical integration was strong - but with a handful of companies;
- In Germany there were about ten generators integrated with transmission - but only partially integrated with supply.
- In Austria there was one large generator which was integrated with transmission, and about 14 regional suppliers fully integrated with distribution.
- In the Netherlands there was an upward vertical integration with the distribution companies controlling the grid and the generators;
- In Belgium, the large majority of the power sector has been private for decades. The private generator Electrabel is supervised and controlled by the mother company, Tractebel;
- Belgium, Germany, Spain, and Switzerland were the only countries in the mid 1990s where private ownership among generators prevailed (tempered in Germany and Switzerland by the local public ownership of distribution and supply, and the former "State enterprise" nature of Endesa in Spain). It contrasted with the state-owned enterprises in France, Italy, Portugal, and the remaining Central and Eastern countries.

2.1 Development of demand and supply

About 2300 TWh were consumed in the CE area in 2004. The largest electricity markets are currently in Germany, France, Italy, and Spain. Highest per capita demand was in Luxemburg, Belgium and Switzerland. The lowest per capita demand was in Poland, Hungary, Portugal, and Slovakia. Demand growth per year was strongest in Spain (+5.0%), Portugal (+4.9%), and Austria (+3.1%). In Poland and Germany demand increased by about only 1%/yr. In the whole of the CE, electricity consumption grew from 1% to 3% per year between 1999 and 2004. Details are depicted in Fig. 2.2, and Fig. 2.3.

Figure 2.1. Electricity consumption in CE countries in 2004

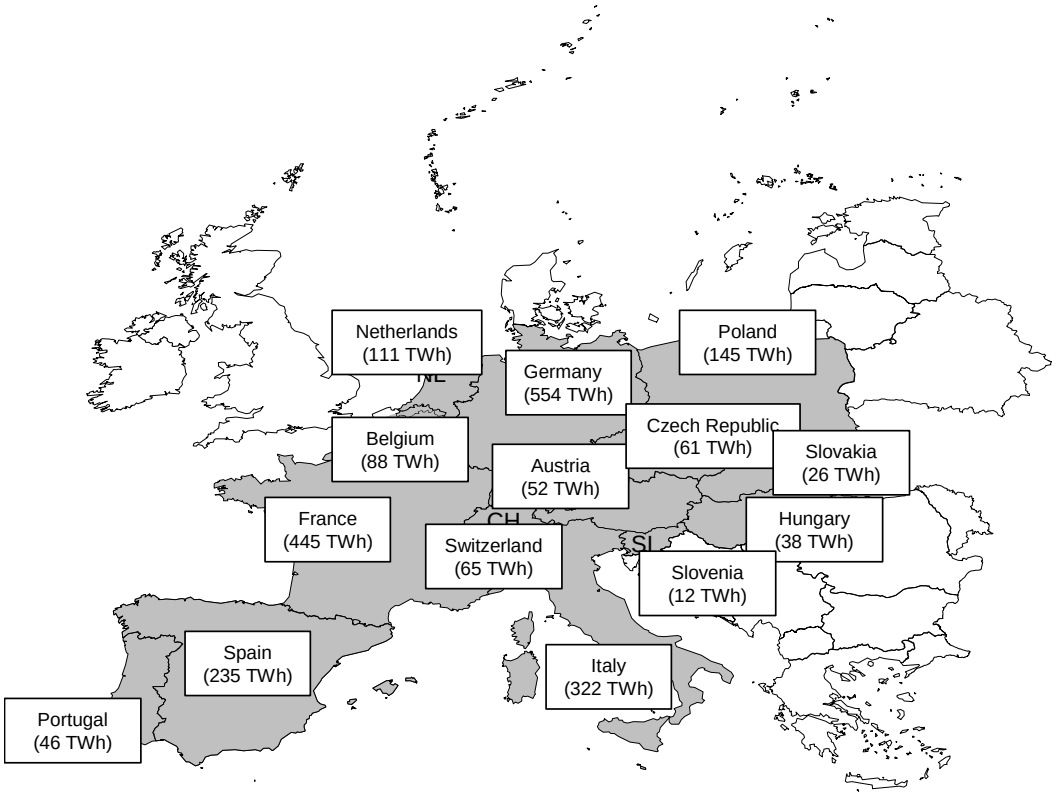


Figure 2.2. Comparison of electricity consumption per capita in CE countries in 2004

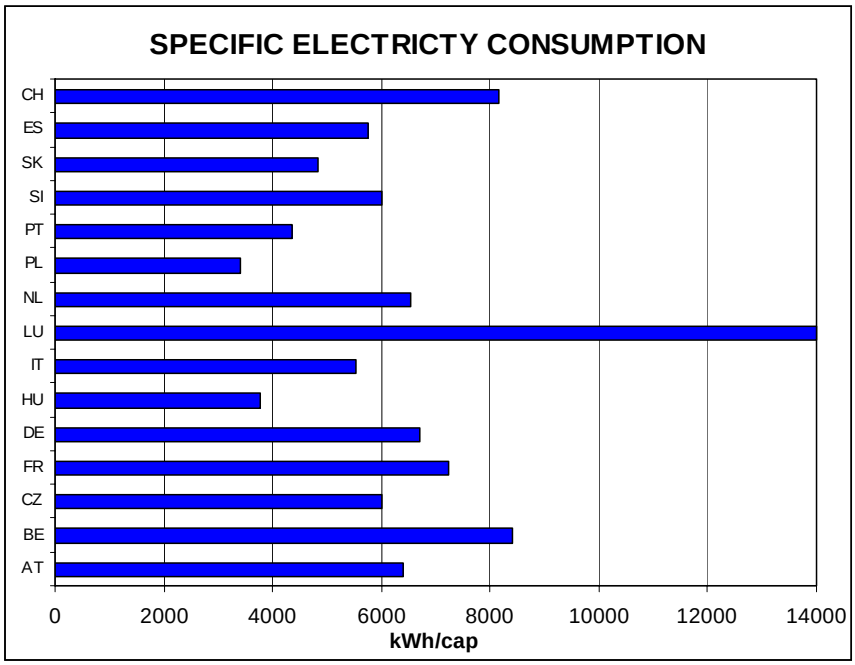
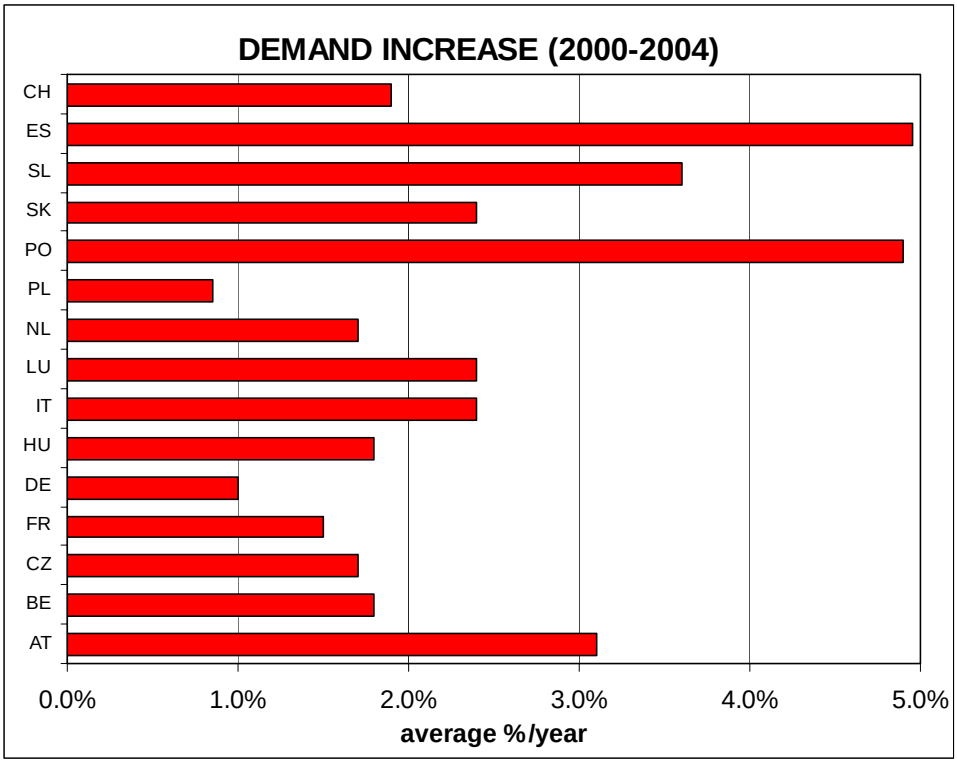
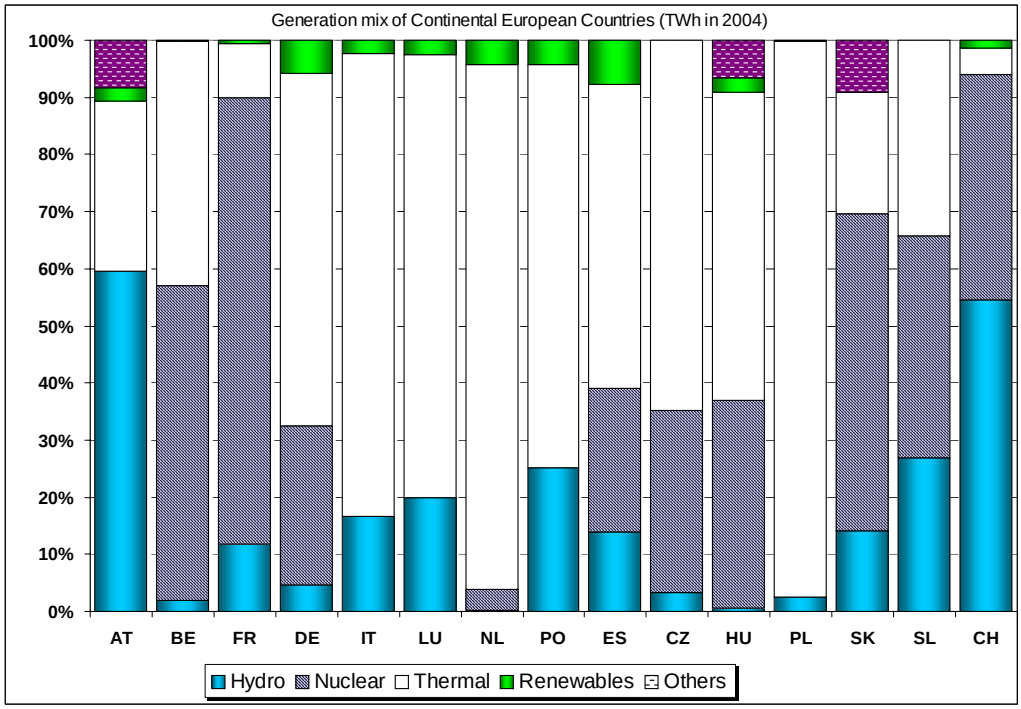


Figure 2.3. Growth of electricity demand in CE countries (Average 2000-2004)



In 2004, generation in CE countries was mainly from fossil thermal power plants (mainly coal) with 51%, followed by nuclear (34%) and hydro (12%). Other renewable (mainly wind) have contributed 3%. As shown in Figure 2.4 the distribution of generation sources across CE countries is rather uneven. In most countries thermal power dominates, in Italy and The Netherlands with more than 80%, in Poland almost 100%. In France, Belgium, and Slovakia nuclear power plays the most important role. Only in Austria and Switzerland does hydro power prevail.

Figure 2.4. Comparison of the fuel mix for generation in CE countries in 2004 (Source: UCTE 2005)



2.2 Generation capacity and load

Capacity margin is different among countries as can be seen from Fig. 2.5. However not all gross capacity is available for generation. This is especially true for hydro capacity (Austria, Spain) and old fossil plants (Italy). E.g. Italy, Austria and The Netherlands which are net importers of energy also exhibit such an apparent excess capacity margin.

Figure 2.5. Installed gross and net generation capacity (except auto producers) and maximum load in CE countries 2004

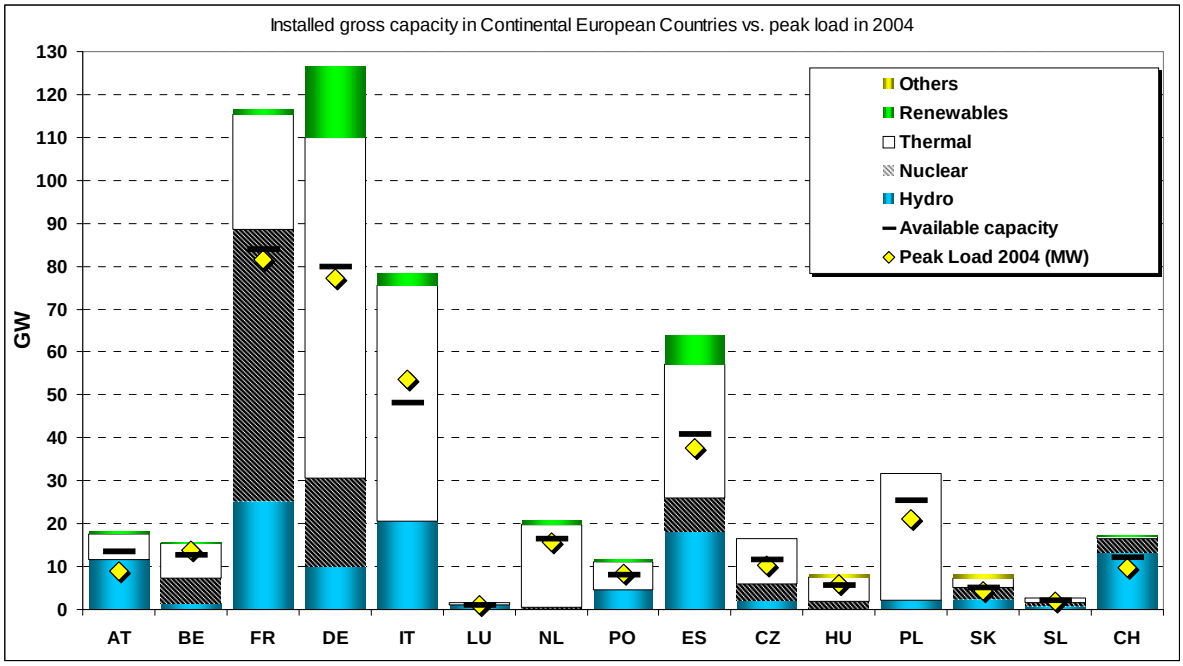
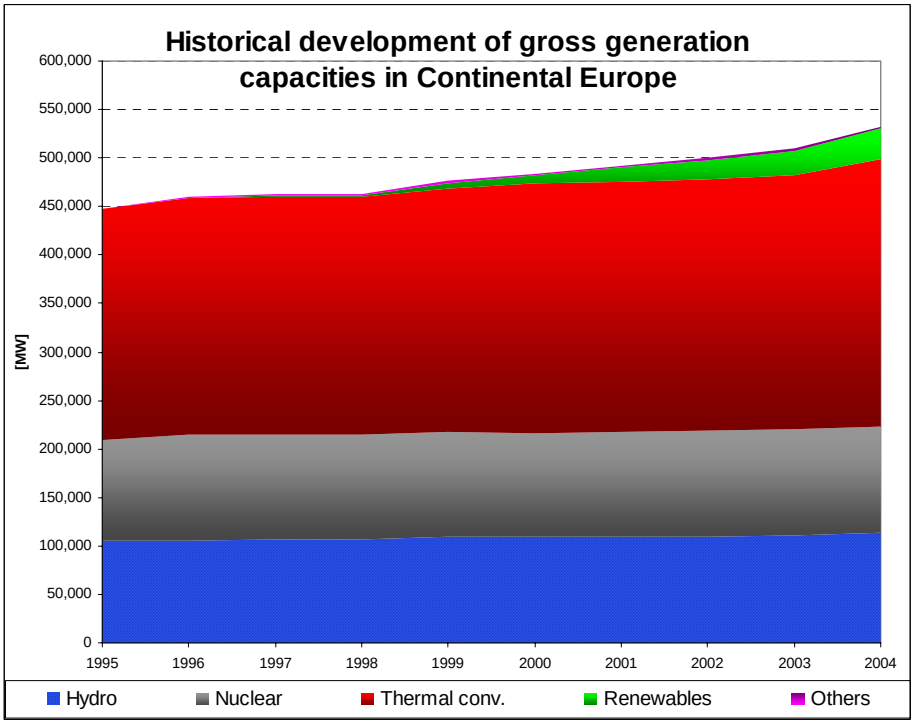


Figure 2.6 depicts the evolution of generation capacity over the last 10 years in CE. The growth in capacity is mainly from wind power and fossil fuel power plants.

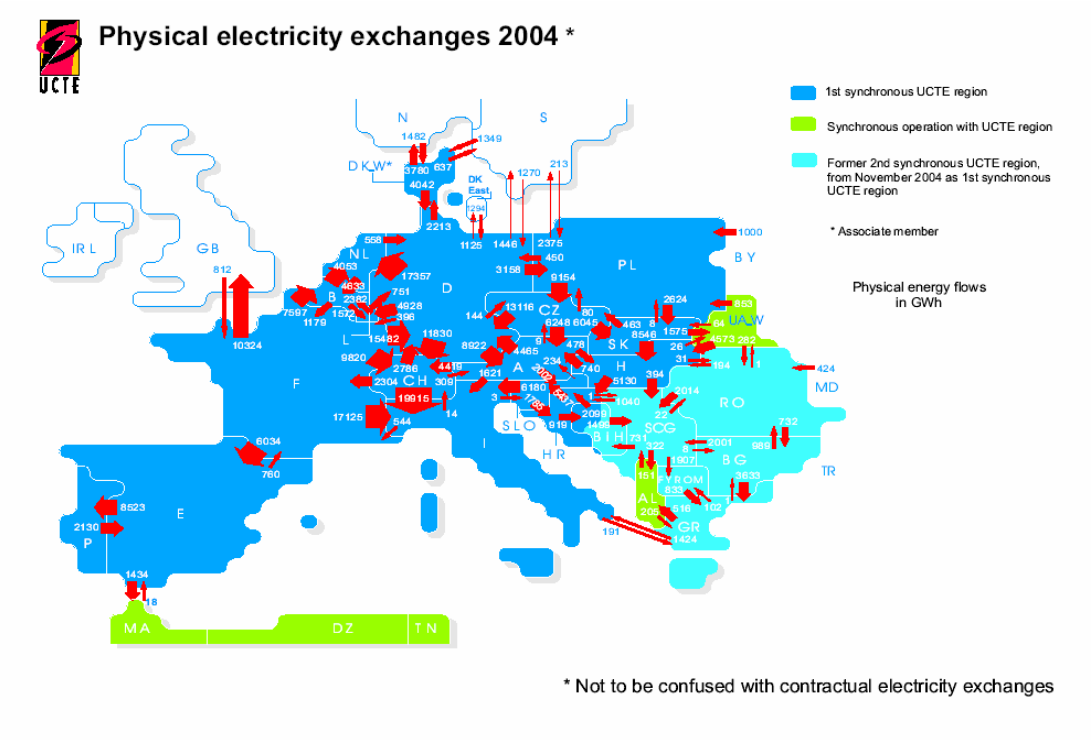
Figure 2.6. Evolution of generation capacity in CE 1995-2004 (Source: UCTE, national reports)



2.3 Development of imports and exports

In 2004, the total amount of electricity exchanges between CE countries stood at about 300 TWh. This is equal to about 13 % of consumption and is frequently limited by constrained cross-border transmission capacity. Figure 2.7 and fig. 2.9 show the physical[2] electricity exchanges between CE countries. France is the biggest net exporter among CE countries with net exports of almost 67 TWh, followed by Czech Republic and Poland. The major importing countries are Italy with 51 TWh followed by The Netherlands and Hungary with 17 TWh and 7 TWh respectively.

Figure 2.7. Electricity exchange in CE in 2004 (Source: UCTE (2005))



The percentage of imports and exports of total electricity demand in CE countries is depicted in Figure 2.8. Smaller countries like Switzerland, the Czech Republic, Slovakia and Luxemburg, with around 20% of net exports related to domestic consumption, transfer the largest shares of their electricity to and from other countries.

Figure 2.9 shows the evolution of imports and exports since the start of liberalization. There is a trend towards a slight increase - but no dramatic boost.

[2] To some extent these flows are not due to contracts between countries but just because of loop flows (e.g. from Germany to Poland to Czech Republic back to Germany)

Figure 2.8. Imports/exports as percentage of electricity demand in CE countries (UCTE (2005))

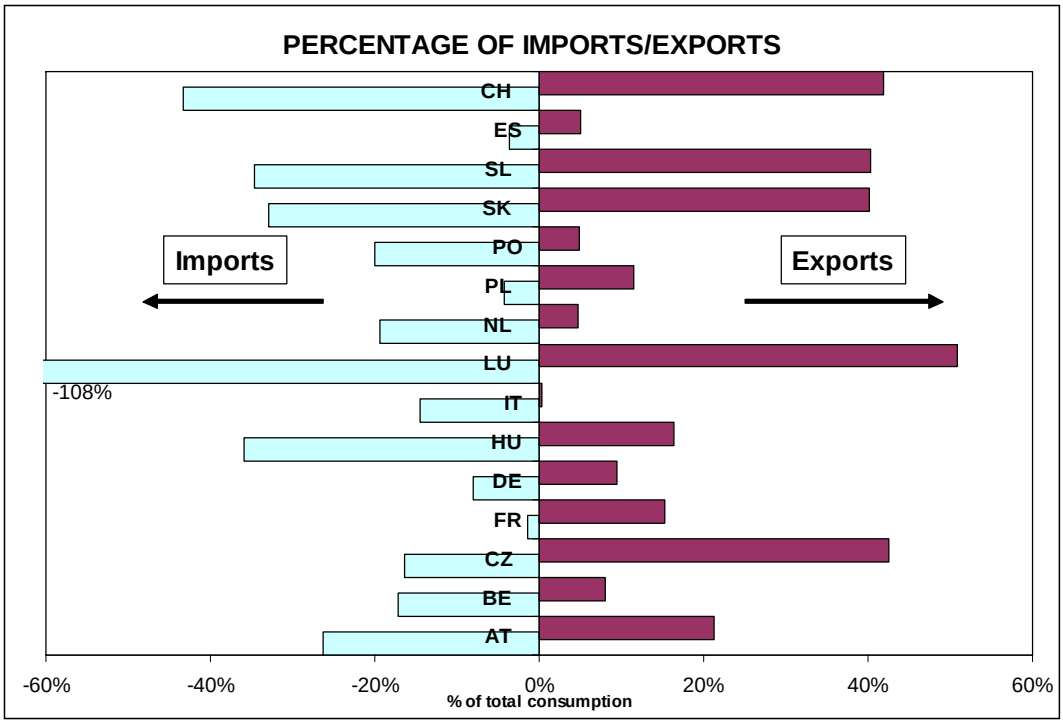
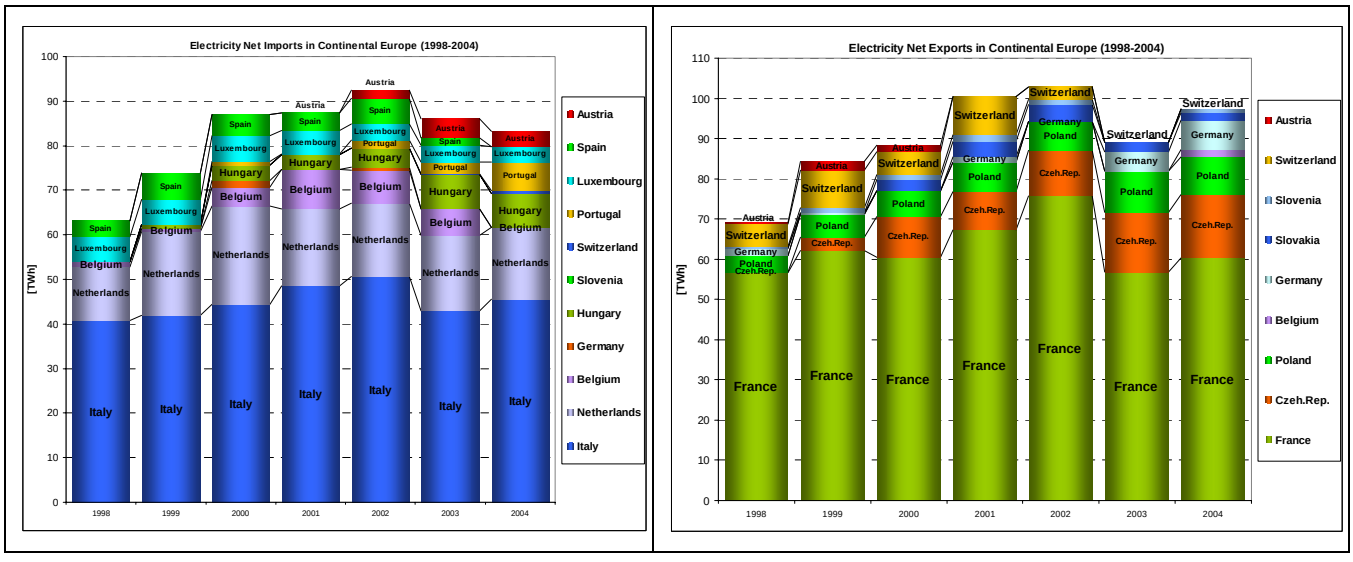


Figure 2.9. Evolution of net imports and net exports over the period 1998 – 2004 (Source: UCTE (2005))



2.4 Past and current issues of transmission

The bulk of the transmission and distribution network in Europe was built between 1950 and 1990 prior to the introduction of market liberalization and has had few additions in recent years.

Figure 2.10. Major bottlenecks in CE transmission grid measured as percentage of use of transmission capacity per year in 2004; Source: UCTE (2005). (For details see Table A-3 in the Annex)

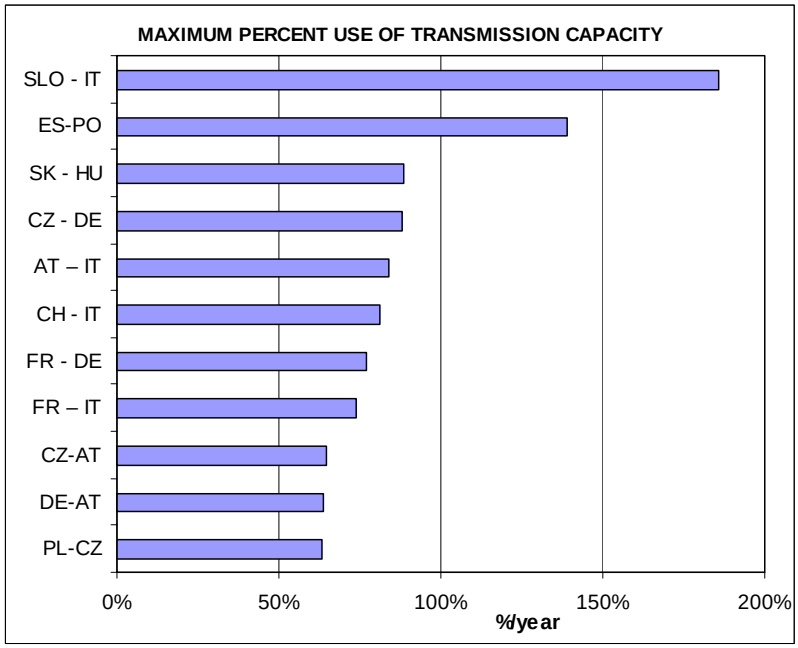


Figure 2.10 shows the highest percentages of Net Transfer Capacity (NTC) used in 2004 between CE countries[3]. Due to the operating complexity of the European meshed network, commercial capacity and physical capacity differ. Hence, the interconnection capacity is defined by ETSO as "NTC". The most congested lines are between Italy and its neighbouring countries; and between Spain and Portugal. But the borders between Germany, Austria and the Czech Republic are next.

In principle the congested lines need a special mechanism so as to be managed in an economic way (see Section 5.6). The existing CE network was built to guarantee a good level of technical reliability and to give some room for managing peak load problems. Now, it is supposed, it is to be used in a more economic way, under optimisation processes of scarce capacity, and to produce price convergence in a single European market perspective.

Basically, in the new competitive system, European interconnectors have to allocate electricity flows from low cost regions to high cost regions, and by doing so, they are expected to produce both a price convergence and a redistribution of stakeholders' welfare.

[3] Further details are documented in Table A-3 in the Annex. It shows current cross-border transmission capacity (Net Transfer Capacity, NTC), as published by the European Transmission System Operators (ETSO) for winter 2004/5, physical flows 2004 and maximal possible (theoretical) annual energy flows between the countries.

3 HOW THE SYSTEM CHANGED – POLITICAL ISSUES OF RESTRUCTURING

The restructuring of the CE electricity market was triggered by the EU- directive on '*Common Rules for the Internal Market in Electricity*' which came into force in February 1999[4]. The major intention was to create a common European electricity market, EC (1997).The major issues of this Directive (officially named 96/92) were:

- Minimal requirements for the *unbundling* of generation and transmission;
- Minimal *market opening*, expressed by the consumption size of "eligible customers";
- Different approaches for the *access to the grid* (negotiated or regulated, TPA or Single Buyer).

However each national government within the EU had to "transpose" the EU Directive into national law and national rules. An overview on the major milestones is provided in Table 3.1.

In practice, the major area of action within the European liberalization project was "providing access to the market". The issues of restructuring generation & supply and designing market places as well as ensuring adequate generation and transmission capacity were paid far less attention to. Independent energy regulators were introduced in all countries except Germany (and Switzerland which is not part of the EU). In addition, environmental issues were also treated very prominently.

On the contrary, aside from a minimal unbundling, the restructuring of utilities and the design of market places was not tackled comprehensively by governments in most countries (few exceptions: Spain created a centralized pool, and Italy divested generation capacities).

[4] As already mentioned in some countries in CE (Germany, Poland, and Spain) steps towards liberalization were set already before the EU Directive went into force.

Table 3.1. Milestones of reforming in Continental Europe

1996	EU-15	European Council of Energy Ministers and Parliament reached agreement on a market liberalisation directive
February 1997	EU-15	This "*Directive concerning common rules for the internal market in electricity*" (Directive 96/92/EC) became valid while waiting up to two more years for its transposition by countries
1998	Spain	Introduction of a Spanish centralised pool
1998	Poland	Introduction of TPA (market opening: 22%)
1998	Germany	100% market opening in one step
February 1999	EU-15	Directive went into force after a 2 years transposition delay: Market opening due the directive in Austria, Belgium, France, Italy, Spain, Portugal and The Netherlands between 30% and 35%
2001	Austria	100% market opening (in a second step)
2001	EU-15	Approval of the "*Directive of the European Parliament and the Council on the promotion of electricity from renewable energy sources in the internal electricity market* (RES-E Directive)" (European Parliament and Council, 2001 – Directive 2001/77/EC)
2003	EU-25	Approval of the "*Directive concerning common rules for the internal market in electricity*" (officially Directive 2003/54; usually named "the Second Directive")
2003	Spain	100% market opening
2004	EU15+10	Extension of the EU to 25 member countries, new CE member countries to open their market with 30 % minimum
2004	EU 25	Electricity Directive 2003/54 due to be transposed by member states; All non domestic customers made eligible in the EU in July 2004 An EU Regulation on cross-border electricity trade came into effect (Regulation 1228/2003) in July 2004
2005	Portugal, The Netherlands	100% market opening
2007	EU 25	Due to Electricity Directive 2003/54, 100 % market opening in all EU-25 countries in July 2007

3.1 Providing non-discriminatory access to the market and to the grid

The first important requirement for a competitive electricity market is non-discriminatory access to the grid. Therefore a prerequisite for competition is the unbundling of generation and supply from transmission. This means that access to transmission and distribution should be offered to all market participants at reasonable and non-discriminatory prices.

So far, the experiences with respect to unbundling between generation and transmission in CE have been different. In Belgium, Spain, Portugal and Italy unbundling of generation and transmission by ownership was achieved either by full independence of the transmission company or by the flotation of a transmission subsidiary. In other countries, especially in Germany and France, only legal unbundling took place. In Switzerland, so far unbundling has only been done by means of internal management measures. These give no structural guarantees for avoiding discrimination in access to

the grid, in particular when no independent regulator is able to monitor the behavior of grid managers. Table 3.2 provides the current status of unbundling.

Table 3.2. Types of unbundling of Transmission System Operators (TSO) and access to the grid in CE (as of 31st December 2004*) (Source: CEC (2004), company reports, Power in Europe (various issues))

Country	Unbundling TSO+)	TSO	Ownership	Access to the grid 2004
Austria	Legal (APG); Management (TIWAG, VKW)	APG (90%), TIWAG (6%), VKW (4%)	100 % public, 100 % public, 51 % public	rTPA
Belgium	Legal (2005: Ownership)	ELIA	100% Electrabel (2005: floated)	rTPA
Czech Republic	Legal	CEPS	(51% CEZ, 49% public)	rTPA
France	Legal	RTE	100% EdF	rTPA
Germany	Legal	RWE Netz, E-ON-Net, EnBW-Net, Vattenfall Transmission	100% RWE 100% E.ON 100% EnBW 100% Vattenfall Europe	nTPA
Hungary	Legal	MAVIR	100 % public,	rTPA
Italy	Ownership	GRTN	100% public	rTPA ... eligible customers SB(rTPA)...captive customers
Luxembourg	Management	ELIA (BE) RWE-Netz (DE)	100% ELIA 100% RWE	rTPA
Netherlands	Ownership	TenneT	100% public	rTPA
Poland	Legal	PSE (Polskie Sieci Elektroenergetyczne S.A.)	100% public	rTPA
Portugal	Ownership	REN	100% public	rTPA ... eligible customers SB(rTPA)...captive customers
Slovenia	Ownership	ELES	(100% public)	rTPA
Slovakia	Legal	SEPS		rTPA
Spain	Ownership	REE	100% public	rTPA
Switzerland	No	Regional vertically integrated companies		No

*) rTPA...regulated third party access, nTPA...negotiated third party access, SB...Single Buyer model. Source: CEC 2005
+) Legal… legal separation of transmission and generation

The second issue is the regime of access to the grid. Table 3.2 shows access to the transmission grid in various Western European countries (CEC (2005)). Access to the grid has been regulated in all countries except Germany where it was introduced in June 2005.

The third issue is market opening. The geographically, and timely different opening of the markets led, at least to some distortions regarding free choice of supplier. Table 3.3 and Fig. 3.1 depict the opening of the market in different CE countries between 1999 and 2005. Some countries like Germany, The Netherlands, Spain, Portugal and Austria have legally fully opened their markets, while

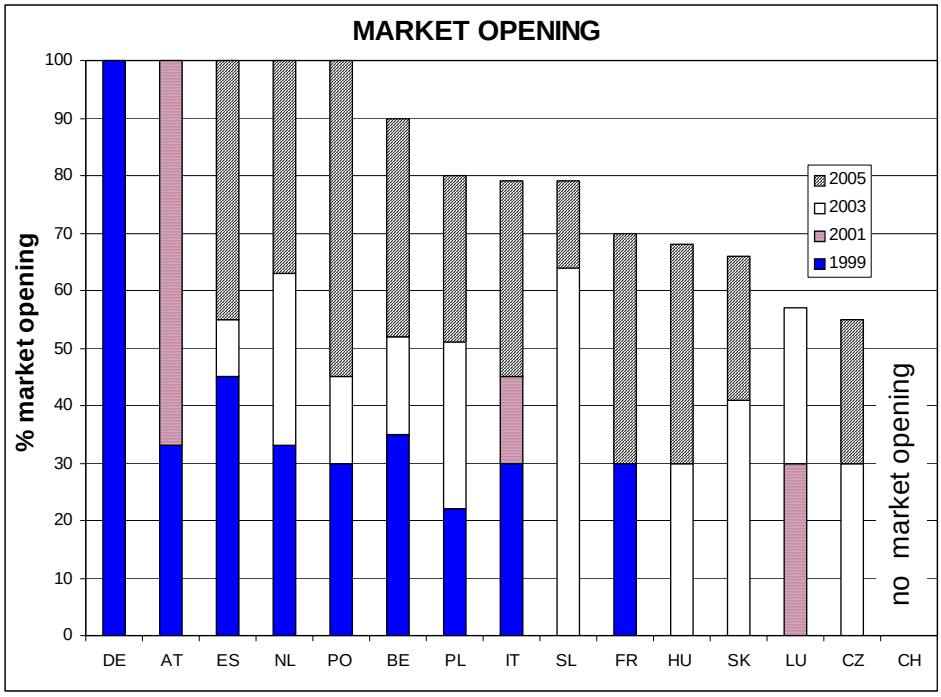
others, like France, Luxemburg, and Czech Republic have only partially opened their's. In Switzerland (which is not member of the EU) there is currently no competition in supply.

Table 3.3. Electricity directive implementation in CE countries. (Source: CEC 2001, CEC, 2005).

Country	Market opening (19 February 1999)	Market opening (1 January 2005)	Eligible customers (1 January 2005)
Austria	30%	100%	All
Belgium	35%	90%*)	>10 GWh*)
Czech Republic	0 %	55%	>0.1 GWh
France	30 %	68%	All non-households
Germany	100%	100%	All
Hungary	0 %	67%	All non-households
Italy	30%	79%	>0.1 GWh
Luxembourg	0 %	57%	>20 GWh
Netherlands	33%	100%	All
Poland	22 %	80%	All non-households
Portugal	30%	100%	All
Slovenia	0 %	75%	All non-households
Slovakia	0%	66%	All non-households
Spain	45%	100%	All
Switzerland	0%	0 %	No final customers

*) Figures for Wallonia. Full market opening in Flanders region

Figure 3.1. Market opening in CE as of 1 January 2005 (Source: CEC (2005) and earlier benchmarking reports)



3.2 The new institutional and regulatory environment

In all countries, except Switzerland, independent regulatory authorities have been founded. An overview of these regulatory authorities and their staff and budget is given in Table 3.4[5]. Powers vary widely from one country to another, but common core tasks are:

- to ensure that unbundling is achieved ;
- to regulate access to the grid; and
- to regulate tariffs for the use of the transmission & distribution grid.

In practice, the current European regulatory governance consists of a decentralized framework on national levels in an incomplete process of convergence. Countries have[6] established nationally-based regulatory authorities which are administered by nationals. Access to the national TSO's grid and operating system is regulated nationally. All this is done legally and with recourse to courts, while the European Directives and Regulations provide only a broad common frame. However the European Commission or the European Court of Justice can block this or that excess on a case by case basis. eg. in summer 2005 the European Court deemed illegal the "grandfathering" priority given to incumbent Foreign suppliers of the Dutch grid interconnections.

Table 3.4 Budget and staff of regulatory authorities in CE (Source: European regulators, AIE, CEC 2004, Kaderjak 2005)

Country	Name (Year of foundation)	Budget 2004 (Mio EUR)	Staff 2004	Origin of budget
Austria	E-Control (2001)	8.3	66	P
Belgium	CREG	11.3	74	L
Czech Republic	ERU	3.8	88	P
Germany	(Bundesnetzagentur, 2005)	-	(180 in 2005)	-
France	CREG	13.8	108	E
Hungary	HEO	6.2	95	
Italy	AEEG	18	100	P
Luxembourg	ILR	0.7	32	P
Netherlands	DTE	5.1	55	P
Poland	URE	7.7	267	P
Portugal	ERSE	7	51	L/P
Slovenia	Energy Agency	1.5	22	
Slovakia	URSO	1.5	57	P
Spain	CNE	20,7	175	P
Switzerland	No	No	No	No

L = Levy on operators P = Public budge No = Does not exist

[5] It would be interesting to analyse whether there is any correlation to the size or budget of the regulator and the working of the market. Yet, unfortunately, such an analysis would go beyond the scope of this paper.

[6] Except Germany and Switzerland

3.3 The promotion of renewable energy

Currently, the promotion of electricity from renewable energy sources (RES-E) plays an important role in the energy policy of the EU. The major policy reasons are: (i) reducing the dependence on energy imports; (ii) reduction of greenhouse gas emissions. To meet this target the EU has defined ambitious objectives which have been formalized in the "*Directive of the European Parliament and the Council on the promotion of electricity from renewable energy sources in the internal electricity market* (RES-E Directive)" (EC 2000). According to this directive, RES-E generation should reach a total share of 22% of electric production in 2010 from a level of 12% in 1998 (EC, 2000). Table 3.5 specifies the indicative targets for the share of RES-E for every CE country to be met by 2010.

Fig. 3.2 depicts the amounts of various RES-E technologies, country by country. Hydropower is the dominant source, but 'new' RES-E's such as biomass and wind are starting to play a role. Wind energy has had a yearly growth rate of about 35% per year over the last decade. Biomass is especially popular in countries like Poland, where it is commonly co-fired in existing coal power plants to meet the negotiated renewable energy share.

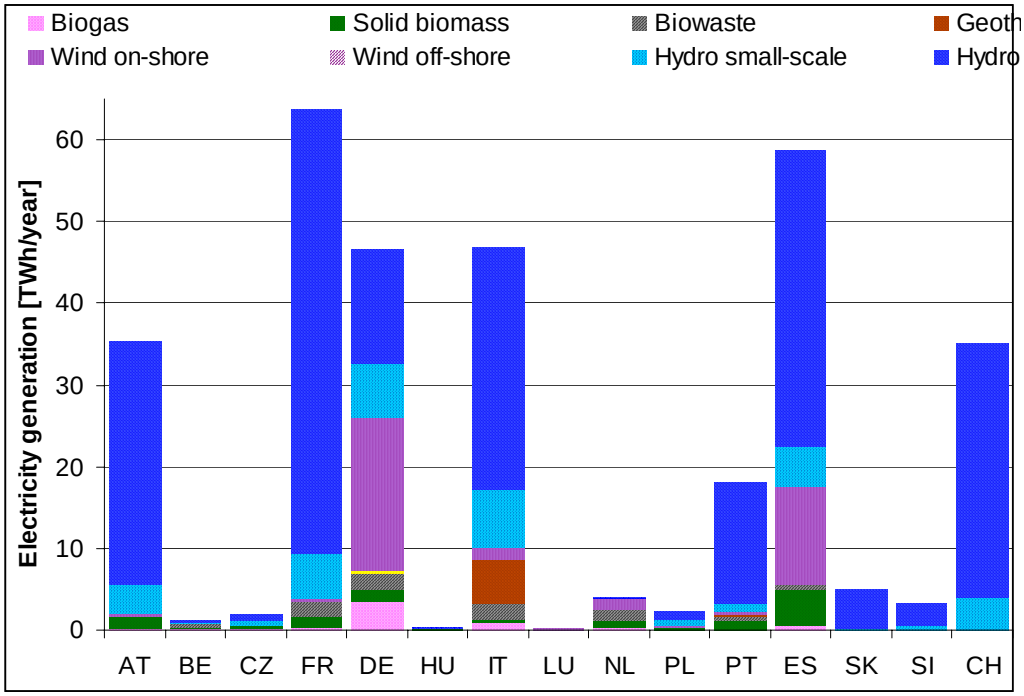


Figure 3.2. Electricity generation from renewable in 2003 by country (Source: EEG TU Wien, GREEN-X database)

Table 3.5. Renewable electricity targets as share of electricity consumption in the EU-25 member states

Country	RES-E penetration 1997 (%)	RES-E target for 2010 (%)
Austria (AT)	70	78
Belgium (BE)	1	6
Czech Republic (CZ)	4	8
France (FR)	15	21
Germany (DE)	4.5	13
Hungary (HU)	0.7	3.6
Italy (IT)	16	25
Luxembourg (LU)	2.1	5.7
Netherlands (NL)	3	9
Poland (PL)	1	7
Portugal (PT)	38	39
Slovak Republic (SK)	18	31
Slovenia (SI)	30	34
Spain (ES)	20	30
Switzerland (CH)	68	No

Yet, the higher costs of RES-E technologies, compared to existing conventional power plants, require financial support. As the choice of instruments has not been prescribed or harmonised in Europe, every country has adopted its own. In Table 3.6 an overview is provided of promotion schemes for RES-E in EU-15 countries for the Year 2004. Feed-in tariffs are currently used in most of the CE countries. This instrument has so far turned out to be the most effective for a fast deployment of significant shares of RES-E[7]. The promotion of wind energy has so far been the most successful in this context. As Figure 3.3 depicts, that due to feed-in tariffs in Germany and Spain, considerable capacity of wind power was constructed up until 2004.

Table 3.6. Overview of the main policies for the promotion of RES-E in CE countries (as of end of 2004) (Source: Huber et al, 2005)

Country	Main electricity support schemes	Comments
Austria	Feed-in tariffs (presently terminated) combined with regional investment incentives	Feed-in tariffs have been guaranteed for 13 years. The instrument was only effective for new installations with permission until December 2004 (except small hydro power). The active period of the system has not been extended nor has the instrument been replaced by an alternative one.
Belgium	Quota obligation system / TGC combined with minimum prices for electricity from RES	Federal government has set minimum prices for electricity from RES. Flanders and Wallonia have introduced a quota obligation system (based on TGCs) with obligation on electricity suppliers. In Brussels no support scheme has been implemented yet. Wind off-shore is supported on the federal level.
France	Feed-in tariffs	For power plants < 12 MW feed-in tariffs are guaranteed for 15 years or 20 years (hydro and PV). For power plants > 12 MW a tendering scheme is in place.
Germany	Feed-in tariffs	Feed-in tariffs are guaranteed for 20 years (Renewable Energy Act). Furthermore soft loans and tax incentives are available.
Italy	Quota obligation system / TGC	Obligation (based on TGCs) on electricity suppliers. Certificates are only issued for new RES-E capacity during the first eight years of operation.
Luxembourg	Feed-in tariffs	Feed-in tariffs guaranteed for 10 years (for PV for 20 years). Also investment incentives available.
Netherlands	Feed-in tariffs	Feed-in tariffs guaranteed for 10 years. Fiscal incentives for investments in RES are available. The energy tax exemption on electricity from RES was finished on 1 January 2005.
Portugal	Feed-in tariffs combined with investment incentives	Investment incentives up to 40%.

[7] For a comprehensive comparison of the relative efficiency of guaranteed feed-in tariffs, bidding system, and exchangeable quotas systems see Finon & Perez (2006).

Country	Main electricity support schemes	Comments
Spain	Feed-in tariffs	Electricity producers can choose between a fixed feed-in tariff or a premium on top of the conventional electricity price; both are available during the whole life time of the RES power plant. Soft loans, tax incentives and regional investment incentives are available.
Czech Republic	Feed-in tariffs (since 2002), supported by investment grants Revision and improvement of the tariffs in February 2005.	Relatively high feed-in tariffs with 15 year guaranteed duration of support. Producer can choose between fixed feed-in tariff or premium tariff (green bonus). For biomass cogeneration only green bonus applies..
Hungary	Feed in tariff (since Jan 2003) combined with purchase obligation and tenders for grants	Medium tariffs (6 to 6.8 ct/kWh) but no differentiation among technologies. Actions to support RES are not coordinated, and political support varies. All this results in high investment risks and low penetration.·
Poland	Green power purchase obligation with targets specified until 2010. In addition renewable exempted from the (small) excise tax	No penalties defined and lack of target enforcement.
Slovak Republic	Programme supporting RES and EE, including feed-in tariffs and tax incentives	Very little support for renewable. Main support programme runs from 2000, but no certainty on time frame or tariffs. Low support, lack of funding and lack of longer-term certainty make investors very reluctant.
Slovenia	Attractive feed-in system combined with long term guaranteed contracts, CO_2 taxation and public funds for environmental investments	None
Switzerland	?	?

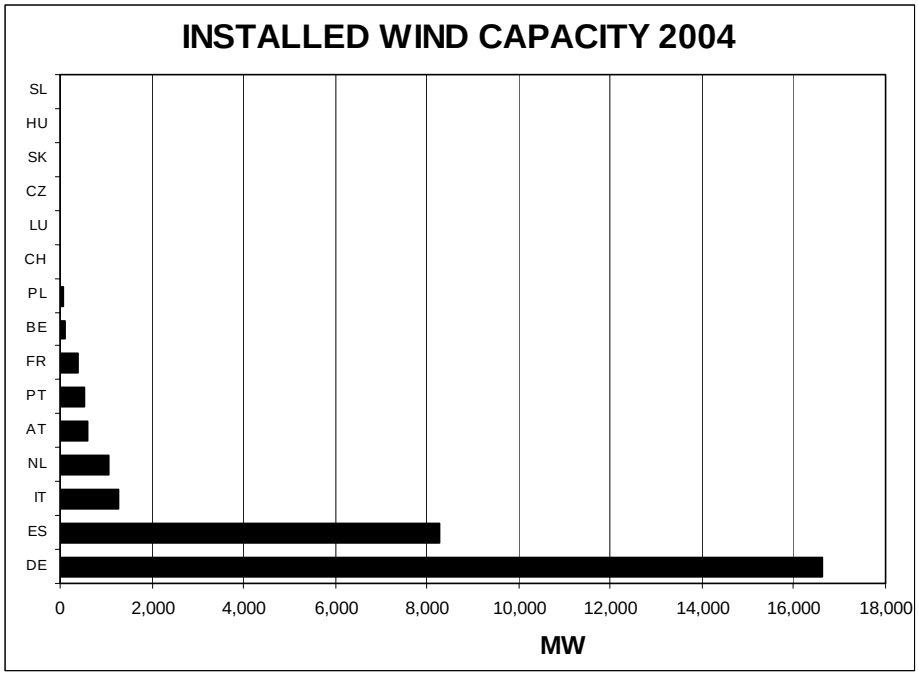


Figure 3.3. Wind capacity in CE by the end of 2004 (Source: EWEA)

4 COMPARISON OF DEVELOPMENTS BY COUNTRY

The developments towards competition in the countries and sub-markets have been quite different so far, as can be seen in Table 4.1.

Germany started with a 100% market opening without any restructuring of the industry. Later on, a rapid merger process took place, resulting in the disappearance of half the generating – transmission companies. Moreover, the German idea of competition was unique because no regulatory authority was created. It soon became evident that high grid charges, discrimination with respect to access to the distribution network, and high transaction costs of the negotiated TPA were major problems for this model, in particular, because of the hundreds of regional or local distribution grid companies. Finally, in 2005 a regulatory body was created.

In Austria the market was legally opened in two steps: 33% in 1999 and 100% in 2001. In 2001 a voluntary spot market – EXAA – was founded. Since 2000 a discussion has been ongoing concerning several models of national and cross-border mergers and takeovers. Yet, so far only minority shares of some suppliers have been sold to the French EdF, or the German EnBW and RWE.

In France, more than 90% of capacity is concentrated in EdF, with two potential competitors who have been institutionally linked to it. These links have been weakened in order to make them independent in the near future, and have been opened to new entrants, notably Electrabel and Enel. These “fringe generators” are CNR, a hydro generator, and SNET, a subsidiary of Charbonnages de France which produces 8.5 TWh by dispatchable coal plants. The transmission business was made a subsidiary in the second half of 2005, and could be floated as soon as 2006. EDF, itself will put around 20% of its shares on the market before the end of 2005.

The major feature, in the Czech Republic and the Slovak Republic, of restructuring was the break-up of the former vertically integrated public utility into generation, grid and supply companies. Furthermore, in the meantime, parts of the generation and supply companies have been privatised. In 1993, the Czech Republic spread about 31% of CEZ shares among investors (individuals and funds). Because an attractive offer was not received for the rest of CEZ, further privatisation has been delayed so far. In the Slovak Republic, 66% of the generator SE is being privatised (2005).

In Hungary, Slovenia and Italy steps were taken to reduce the power of the former generation monopoly.. Currently, however, it appears that in these countries the former monopolists still have a strong position in the market (ENEL kept 50 % of the Italian generation capacity, plus the cash made by selling the rest of its plants - as “Gencos” or by the sale of transmission and distribution grid shares).

In the Netherlands, until 1998, generation was dominated by four large regional companies: EPZ, EPON, UNA and EZH, who jointly owned the generator SEP. The Dutch government’s initial idea was to combine liberalization in supply with the concentration in generation by merging the four companies and SEP. This attempt should have created a “national champion” that would be able to compete on the European scene. (van Damme 2005). Yet, the merger failed because these companies could not agree. The major restructuring feature was then the sell out of half of the former largely public owned generator to companies from abroad (Electrabel, Reliant, E.ON).

Another trend is the vertical reintegration of generators and suppliers e.g. by the purchase of power plants by suppliers. After a series of mergers and takeovers, two large Dutch companies survived and are now integrated into generation, distribution and supply (ESSENT and NUON). The TSO TEnnET and its subsidiary, the PX of Amsterdam, have been 100 % state owned for some years.

In Belgium, the process has been dominated by the incumbent company Electrabel, which is controlled by the Suez group (France) through the intermediate engineering contractor Tractebel. A "second" Electrabel was developed outside Belgium by collecting 15 000 MWe plant capacity, mainly in Europe (the Netherlands, Poland, Hungary, Italy, France, Spain). In spring 1999, Tractebel pretended to become a liberalisation champion. They split their companies into parts while keeping control over all of them all. In 2005 however, Electrabel and Tractebel were merged to increase their stock market size. They understood that being one of the oligopolistic players on the European and world wide market was more profitable than to stay linked to the limited Belgian market (Verbruggen A. Vanderstappen E., 1999).

The Spanish approach initially looked like being one of the most ambitious. However, the structure of the industry with two dominant producers integrated in distribution and supply was never changed. As a result, after the introduction of a centralised pool[8] in 1998, the issue of market power exerted by the two largest incumbent generators was very soon raised. Crampes & Fabra state in (2005): "*The 1997 reform did not succeed in introducing effective competition but retained an opaque regulation which has been subject to continuous governmental interventionism. …*" Note, that due to scarce interconnection capacity between Spain and neighbouring countries foreign utilities have not been very influential in the Spanish pool so far. The issue of market power is still – in 2005 – the major problem in Spain and could be reinforced by the take over attempt of the first gas company Gas Natural of the first electrician Endesa. In 2005, an investigation in the competitiveness of the Spanish market was conducted by I. Perez-Arriaga, and the new government is reviewing the rules with the view to changing them. As well as transmission, there were only four significant companies, all largely private and vertically integrated. While the former government blocked the merger of the two largest utilities (Endesa and Iberdrola), it allowed the takeover of Hidrocantabrico by EdF and by the formerly Portuguese, EDP. Furthermore, when Endesa put 5% of its activities up for sale, it was bought by Enel of Italy, as Endesa had just taken control of Elettrogen in Italy (Soares (2003)).

In Portugal, the hard process of the privatisation of the EDP, and the creation of a competitive affiliate (SENV) has been shaping the reform process so far. The idea was to split the national Electricity System into two sub-systems: the Public Utility System SEP and the independent system SENV. SEP and SENV are not generators, but sub-systems of the National Electrical System. The former has to satisfy demand under the principal of a uniform tariff on the mainland, which moderates the application of market rules. It also has centralised planning. The latter has no responsability for public service and comprises of two sub-systems: the non-binding system (SENV) and the Independent Producers. The SENV operates according to market rules and comprises of producers,

[8] While the participation in this pool is in fact mandatory, market participants are also allowed to enter into physical bilateral contracts (Crampes & Fabra 2005).

distributers and eligible customers. Non-binding producers and customers are allowed to use the public utility system grid for a fee (Soares (1993)).

Other objectives, since the start of reform in Portugal, have been to create a "national champion" by merging gas and electricity monopolies (which was refused by the European Competition Authority) and a joint Iberian market with Spain (The MIBEL project). Yet, so far this Mibel has been repeatedly postponed and currently, it is being planned to put it into practice in 2006. One problem is that "without substantial enhancements to interconnection, it should be clear that the impact of the Spanish market on the highly concentrated, Portuguese market can only be marginal, and the impact of the Portuguese wholesale market on the Spanish minimal". (PiE 437, p.3).

With respect to divestment of capacity, Italy was the only country in Continental Europe where the former state-owned champion had been privatized and had to give away generation capacity (Lorenzoni (2003)). Currently, however, ENEL is in a comfortable position because it is still the largest electricity producer in a market with congested borders and a congested internal grid and can act as a private company with the cash generated by its divestiture. ENEL has now a market share of 50% of generation capacity, and an Italian power exchange has been opened.

In Switzerland a draft law providing for ultimately complete opening of the Swiss electricity market was rejected by the Swiss population in a referendum in 2002. Another draft law providing for market opening for larger industrial customers was provided for discussion in 2004. Given the legislative procedure and a possible new referendum, first steps of market opening can be expected, in the case that the law is finally approved, at the earliest in 2008 (CEC, 2005).

Table 4.1. Differences in reforming and market design in various countries

	Process of market opening	**Mandatory pool**	**Voluntary Day Ahead Exchange**	**Futures market**	**Privatisation process**	**Divestment of generation capacity**	**Takeover, Merger within the country**
AT	Fast (2 years)	No	YES (EXAA)	YES (EEX)	Moderate	No	Under discussion
BE	Slow	No	No	No	*)	No	No
CZ	Moderate	No	Yes (2004)	No	No	No	No
DE	Very fast	No	YES	Yes	*)	No	YES, half electricity generation plus Ruhrgas
FR	Slow	No	Yes	No	No	No	YES, 2 fringe generators
HU	Moderate	No	No	No	Moderate	No	No
IT	Slow	No	Yes (since 2004)	No	Yes	Yes	YES, mainly abroad (ENEL in SK)
LU	Slow	No	No	No	N.A.	No	No
NL	Moderate	No	Yes (APX)	No	Yes	No	YES, mainly from abroad
PL	Fast	No	Yes	No	Moderate	Yes	Moderate
PO	Moderate		No, but intended with Spain	No	No	Yes, moderate	Moderate abroad
SK	Moderate	No	No	No	Yes	No	No
SL	Moderate	No	Yes (2003)	No	Moderate	Moderate	No
ES	Moderate	Yes	No	No	*)	No	No
CH	No	No	No	Yes (EEX)	*)	No	No

*) Major generators were already largely private before liberalization started

Eastern European countries are physically integrated within the western European grid, and have taken the first steps towards adopting the "western model" with regulated third party access for larger customers. There has been partial privatisation of companies within the industry (except in Slovenia) and the reduction of barriers to international trade. But, like the rest of Europe, each reform is unfinished in regard to its market design and the existing market power of the dominant player.

The typical Eastern European market structure is made up of a dominant wholesaler and a competitive fringe. The competitive fringe is strongly limited by long-term contract structures that often allow the dominant wholesaler to deploy the generators, so being able to deny other companies' access to surplus capacity that has not been contracted in advance. (Kaderjak, 2005) It is also the case concerning the support for renewable energy which often takes the form of a feed-in tariff under which the power is sold to the dominant wholesaler, thus consolidating its position even more.

Poland and Hungary were the forerunners of reform in Eastern Europe. Poland introduced TPA in 1998, and. the Czech Republic and Hungary conducted unbundling of generation and transmission in the early 1990s. Hungary established a regulator in 1994 and started privatisation of supply and most of generation in 1995. At the same time the gradual removal of price subsidies was started (Kaderjak, 2005).

5 THE MARKETS: STRUCTURES AND PERFORMANCES

The markets' structures and performances after the start of liberalization can be measured in different ways. However the evolution of electricity prices is, presumably, the most important indicator. A desirable outcome of a single European electricity market is the achievement of a lower price and a price convergence through wholesale and retail competition (Politt and Jamasb (2005)). Hence, in this section, after having examined the characteristics of the markets and the markets' structures, focus will be put on prices changes for differing groups of customers and in various regions.

5.1 Characteristics of the markets

Table 5.1 depicts the markets in CE. In particular, the degree of liquidity in spot markets and bilateral markets is indicated. As the European Commission states (CEC, 2005): "*Ideally spot markets should have enough liquidity to give a reliable and transparent price signal. (….) The normal benchmark from other commodity markets is that the volume of trade (of long term contracts) should be roughly 10 times the amount of physical delivery*."[9] As Table 5.1 shows, no CE market is

[9] In the E.U, there are differences regarding the mutual role of bilateral trade (with or without use of a broker) and power exchanges (PXs). We cannot guarantee the data in Table 5.1 which is mainly based on an EC report (CEC (2005)). The OTC figures are likely to be higher. There is no real transparency in the markets outside PXs and therefore it is not clear what conclusions can be drawn.

approaching this level. As can be seen from Table 1.x in chapter 1 of this book no CE country is in the list of the twelve most competitive countries.

Table 5.1 Trading in CE in 2003/2004: Spot markets, centralized vs mandatory pools and OTC (Source: CEC(2005) and own investigations)

	Total Supply 2004 (TWh)	Spot market / Centralized mandatory or voluntary pool	Volume (TWh 2004)	OTC (TWh 2004)
AT	51.8	EXAA	1	N.A.
BE	87.5	No		N.A.
CZ	61.4	OTE	0.3	N.A.
DE	445.1	EEX (Sp.m.)	39	342
FR	554	Powernext (Sp. M.)	7.5	300
HU	38.2	No		N.A.
IT	322	Yes (2005)	2	56
NL	6.3	APX (Sp. M.)	15	240
PL	110.9	Pol-PX	1.1	N.A.
PO	144.8	No		N.A.
SK	45.5	No		N.A.
SL	26	SLOex	0.36	N.A.
ES	12.3	OMEL (C.p.)	204	5
CH	234.5	No		N.A.

Most of the CE countries have few and relatively illiquid organized markets (PXs) for electricity. Such spot markets which exist, as in Poland and Slovenia, trade less than 5% of the total electricity consumption. Bilateral contracts are the most frequent form of “trade” arrangement in new EU members’ states.

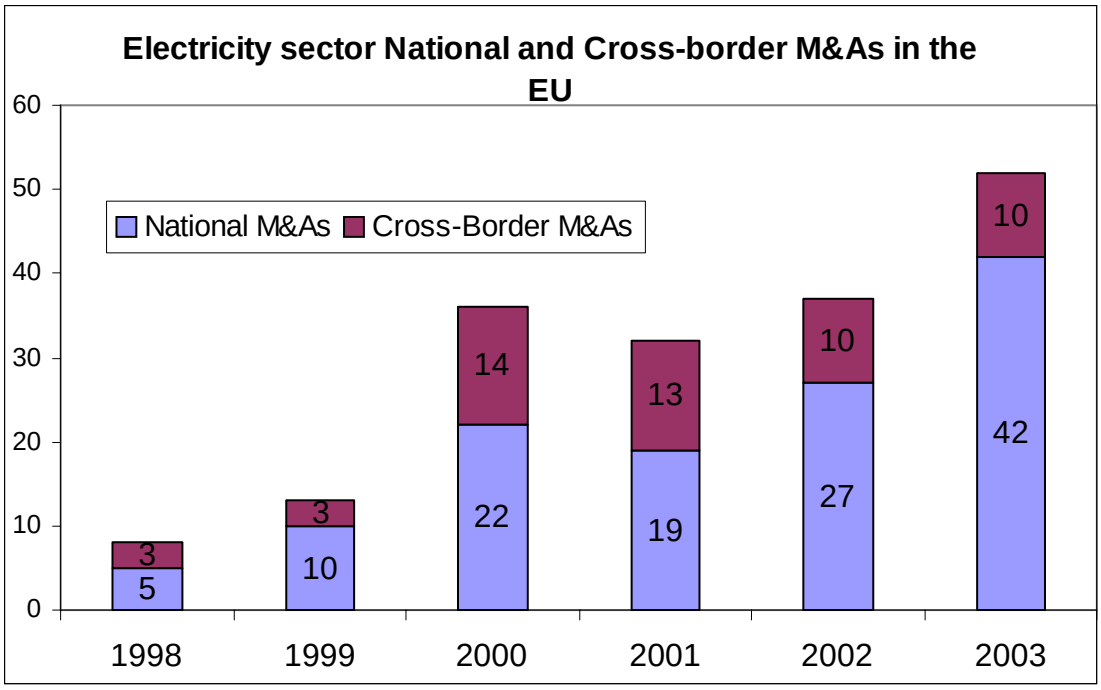
5.2 Mergers, takeovers and market concentration

The industrial reference model for electricity completely changed between 1995 and 2001. It has shifted from a preference for vertical disintegration between generation, trading, and sales to final consumers toward a preference for vertical reintegration of production, trading, and final sales. Among the best illustrations of the changing “industrial paradigm” are the shifting attitudes of financial markets, financial analysts, rating agencies, and banks vis-à-vis disintegrated structures, especially concerning “pure” trading and “pure” generation as in Merchant Plants. Bankers and financiers have finally joined force with stockholders and managers of firms operating in competitive energy markets, and concluded that vertical integration is the best protection against volatility and the cyclical nature of markets.

Hence, for effective competition, a large number of companies is required. This has been clearly proven by the English and Welsh examples, where the number of generators has been increased several times by the regulatory authority (as well as by investors, notably the regional distribution & supply companies, the RECs).

The "merger-mania" within the CE after the start of liberalization indicates that the major strategy of the bigger incumbent utilities is competing by merging so as to to purchase market shares. Fig. 5.1 depicts the mergers within the EU. These activities reached a maximum number in 2003, four years after liberalization started.

Figure 5.1. Number of mergers within European electricity companies from 1998 to 2003. (Source: Codognet et al 2005).



In addition to vertical reintegration, we also observed intense activity in horizontal mergers and acquisitions The most significant example is doubtlessly Germany, where the ten biggest electrical and gas concerns that existed at the time the European directive was adopted in 1996 have now become four. As in the German example, integration and concentration between electricity and gas is another defining feature of this new “consolidation” phase in Europe’s energy industry. Among the seven biggest electricity firms in Europe, Vattenfall and EDF have proven themselves to be anomalies because they are notably less involved in gas to date. Finally, while gas wholesale markets and concerns have persisted in courting the entry of large European and North-American petroleum and gas companies, electricity wholesale markets, and electricity and gas retail markets, have not experienced any comparable influx. Thus, the upshot is a net “consolidation” of the industry on the pan- European scale, with an increasingly concentrated small number of international European firms in the sector, sometimes mockingly called the “seven brothers” in a transparent reference to the “seven

sisters" of the international petroleum industry in the 20th century. Nonetheless, on a country-by-country basis, the European Union often comes across as juxtaposing domestic markets of monopolies or duopolies with a small competitive fringe in which one, two or three fringe new entrants operate.

In many Eastern European countries, national companies have been sold to strategic investors from abroad, with EdF E.On, RWE, Electrabel and Vattenfall particularly active. In reaction, some countries like Czech Republic, Slovakia & Slovenia have been concerned with the retention of national champions. These national champions have the size to survive among the larger European groups with their unfortunate consequences for the level of competition within their national market and the European competitive game. The vested interests of the dominant incumbents in this region are encouraging them to fight against greater competition which is being pushed by further reforms.

How should these mergers be seen in the light of competition? In principle, mergers and acquisitions should not be a major preoccupation. On the one hand, this issue is "old hat" in European competition policy, and, on the other hand, it is an excellent lever for directly obtaining structural remedies on a European scale that would be otherwise unattainable. If, nonetheless, certain "real" problems emerge, this more likely reflects on the deficiency of certain national rulings, especially when governments or "ordinary" judges can deliberately ignore the anticompetitive effects of their decisions. This would result at the very least, in a lack of harmonisation between national decisions and those taken at the European level. The E.ON-Ruhrgas merger in Germany which created the biggest gas & electricity concern in the western world, will remain a bone of contention and a source of confusion for a long time. However, we cannot see any simple workable solution given the unwillingness of national governments to remedy the situation. The recent strengthening of the harmonisation and cooperation between national and European authorities affects only the competition authorities, and not the other national third parties that possess other real decision making powers. See how Portugal, and more recently Spain paid for having national gas and electricity mergers..

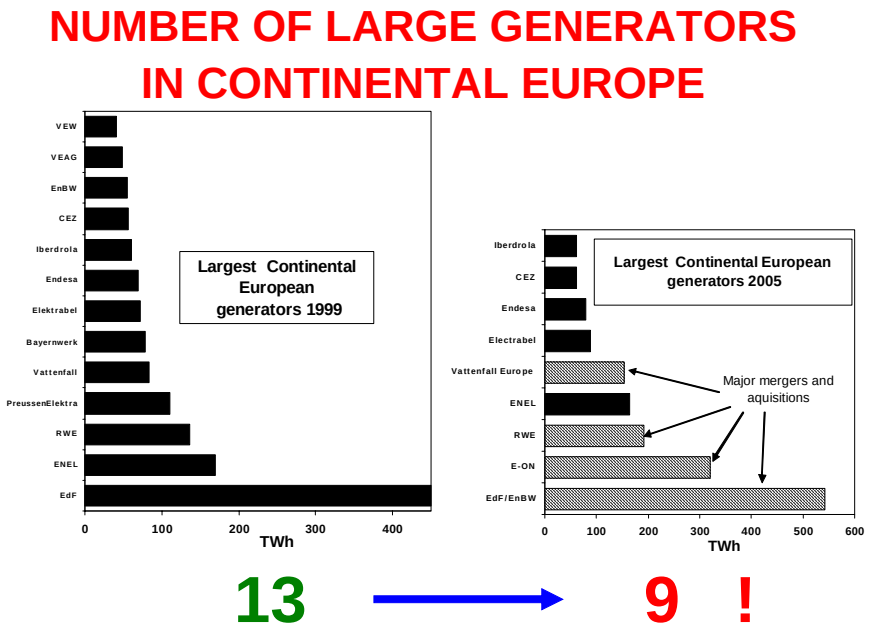
With respect to market shares in CE, in 1998 ten generators owned 60% of the generation capacities, in 2002 it was only six (see Codognet et al (2005)). Thomas (2003) suspects that finally European-wide only "seven brothers" will remain as large generators. Of particular concern, with respect to competition, is the situation in Central Europe (France, Germany, the Benelux countries and Austria). The concentration process in the electricity generation market was especially fulminous in Germany. Mez (2003) provides an impressing and detailed description of this process. A different but converging picture is described in Finon (2003). He portrays how a dominant player like EdF in France can benefit from liberalization by exerting market power in the home market, while at the

same time is pursuing an aggressive acquisition policy abroad. Verbruggen et al (1999) show the same for Electrabel – Distrigas group in Belgium.

As can be seen from Fig. 5.2, of the 13 largest generators which existed in 1999 – the year liberalization started - in CE five years later only 9 remained. Now in Continental Europe seven large concerns dominate the market: EdF-EnBW, RWE, E.ON, Vattenfall, Endesa, ENEL, and Electrabel (Haas et al 2002).

Another interesting fact is – Table 5.2 – that in the ranking of the largest generators public ownership still prevails.

Figure 5.2: Largest European electricity generators in 1999 and 2005. Source: own investigations.



Of special interest is that the larger European groups put special focus on extension of their interest spheres to regions which are adjacent or separated by low transmission capacity from their home area (see Fig. 5.3).

Figure 5.3.: Mains congestion and major M&As in CE (Source: Parthenay and Perez (2005)

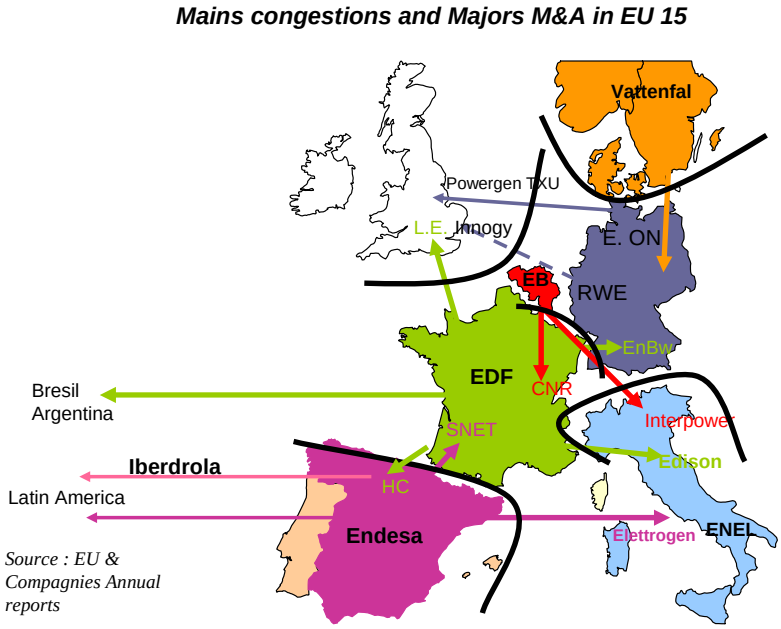


Table 5.2. Largest generators in various countries in 2004 and their ownership structure (Source: company reports, Power in Europe, personal information)

	Generation (TWh) [Wholesale (TWh)]	Capacity (GW)	Public ownership (in 2005)	Other significant ownership shares
EdF	487	119	100%	
E-ON	137	36	5%	56 % financial sector*)
RWE	192	43	33%	50 % (?) banks …*)
ENEL	165	45	32%	
Vattenfall DE (Germany only)	81	16	89 % (Swedish government)	
Electrabel (BE) BE only?	75	28	0 %	Suez (51%) (100% in 2005)
ENDESA (ES)	70	28	42%	
IBERDROLA (ES)	61	16	0 %	EdP (4%)
CEZ (CZ)	57	12.3	69%	
EnBW (DE)	55	12	45% EdF (French government) 25% Public German ownership	
BOT (PL)	46.6	8	100%	
Union Fenosa (ES)	30.8	5.2		
VERBUND (AT)	28.5	7.3	51%	WIENSTROM (10%), EVN (10%)
MVM (HU)	[28.3]	N.A.	98 %	
Slovenske Elektrarne (SK)	27	6.95	34%	66% ENEL +)
EdP (PO)		12	51%	Iberdrola (4 %)
PKE (PL)	19.5	5	85%	
Hidrocantabrico (ES)	18.0		60% Portuguese government (via EdP)	
ElectraBel NED (NL)	17.9	4.7		
HSE (SL)	7.1		100%	

*) E.ON and RWE are not ready to reveal more detailed information on the ownership structures of their companies

+) in 2005 in process of privatization

Table 5.4 depicts the current market structure in CE countries. In most countries market structure is highly problematic particularly when the national grid is poorly connected with adjacent markets. It is of specific interest that potential imports vary considerably. The small countries Luxemburg, Slovakia, Slovenia, Austria, and Hungary have a potential of more than 70%. In the large countries Spain, France, and Italy the potential is less than 20%.

Table 5.4: Market shares of largest generators in various countries 2004 (Source: company reports, Power in Europe, personal information)

	Largest (%)	3 largest (%)	Import potential (TWh, %)	Largest generator	2nd largest generator	3rd largest generator	4th largest generator
AT	53	76	37.7 (73%)	VERBUND (53%, 29.8 TWh)	TIWAG (13%, 6.7 TWh)	WIENSTROM (10%, 5.8 TWh)	EStAG (9%, 5.0 TWh)
BE	85	94	40.3 (46%)	ELECTRABEL (85%, 75 TWh)	SPE (9%, 8 TWh)		
CZ	73	82	30.7 (50%)	CEZ (73%)	Pražská teplárenská (5%)	Energotrans (4%)	Dalkia (3%)
DE	34	71	122.6 (28%)	RWE (34%)	E-ON (23%)	Vattenfall (14%)	EnBW (10%)
FR	89	94	106.9 (19%)	EdF (89%, 487 TWh)	CNR (3%, 16 TWh)	SNET (2%, 9 TWh)	
HU	46	65	27.2 (71%)	MVM (46%)			
IT	46	65	52.6 (16%)	ENEL (46%, 165 TWh)	Edison (12%, 20 TWh)	Edipower (7%, 10 TWh)	Endesa (6%, 5 TWh)
LU	65	90	8.8 (139%)	Cegedel (65%)	Sotel (25%)		
NL	25	80	41.2 (37%)	Electrabel-Ned (17.9 TWh)	ESSENT (14.65 TWh)	NUON (14.5 TWh)	E-ON Benelux (9.9 TWh)
PL	30	52	30.7 (21%)	BOT (30%)	PKE (13%)	Kozienice (9%)	PAK (9%)
PO	65	80	8.8 (19%)	SEP	SENV		
SK	84	89	26.3 (101%)	Slovenske Elektrarne (26 TWh, 84%)	PPC (3.5 %)	TEKO (1.4 %)	
SL	54	98	18.4 (150%)	HSE (7.1 TWh, 54%)	ELES/GEN (5.2 TWh, 39%)	TET (0.6 TWh, 5%)	
ES	39	78	19.3 (8%)	Endesa (39%)	Iberdrola (28%)	Union Fenosa (11%)	Hidrocantabrico (7%)
CH	26	53	74.9 (137%)	NOK (25%, 15.9 TWh)	BKW (15%, 9.4 TWh)	ATEL (13%, 8.3 TWh)	EWZ (7%, 4.3 TWh)

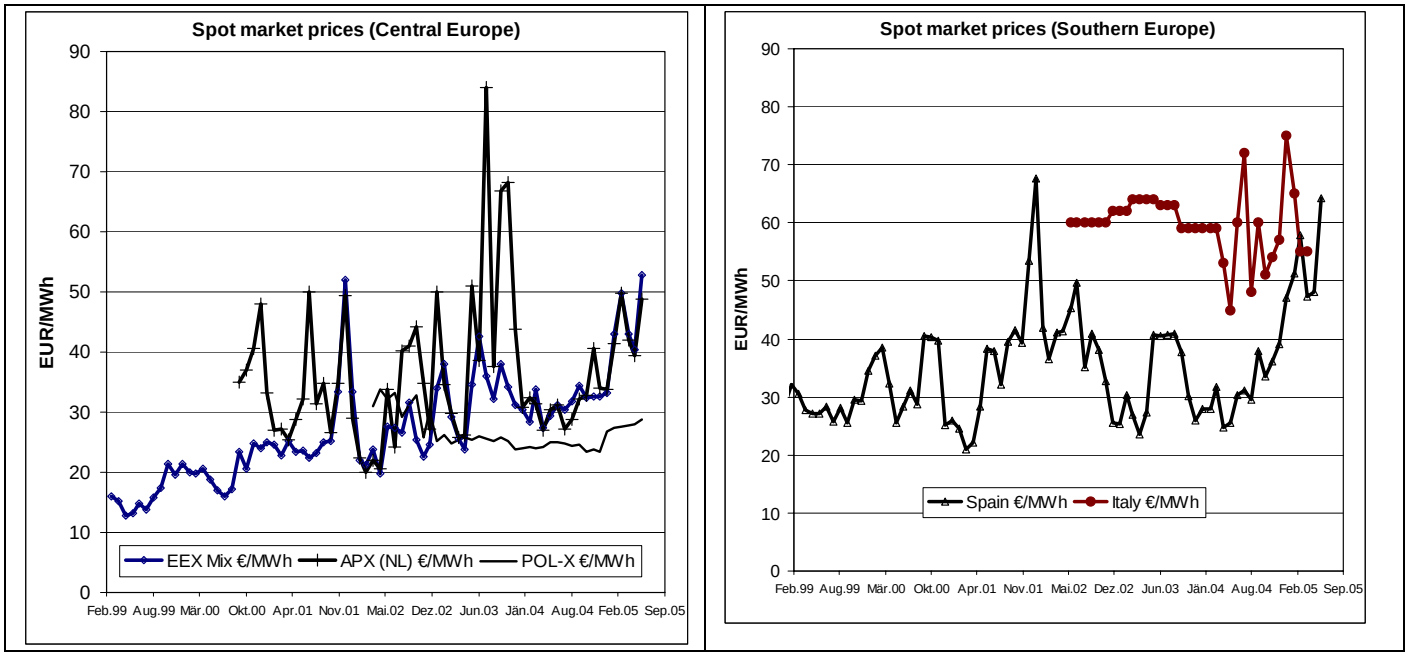
5.3 Wholesale electricity price evolution

How electricity prices developed after restructuring is of special interest. Figure 5.4 depicts the price evolution in CE in 1999-2004. With the exception of Italy in 2004 there was some convergence of wholesale electricity spot market prices. Moreover, while volatility in 2002 and 2003 was rather

high it became moderate during 2004. In the first half of 2005, prices in Western markets increased, while prices in Poland remained stable in 2004.

From Fig. 5.4 the following observations can be made: (i) In Western Europe, prices increased were relative to the frame and timing of liberalization; (ii) the price level is highest in areas where capacity margin is smaller, and cross-border transmission capacity is congested (Italy, The Netherlands); (iii) prices have been highest in years when there was low hydro or low nuclear availability; (iv) however wholesale prices are increasing and are converging in markets which are connected by sufficient transmission capacity .

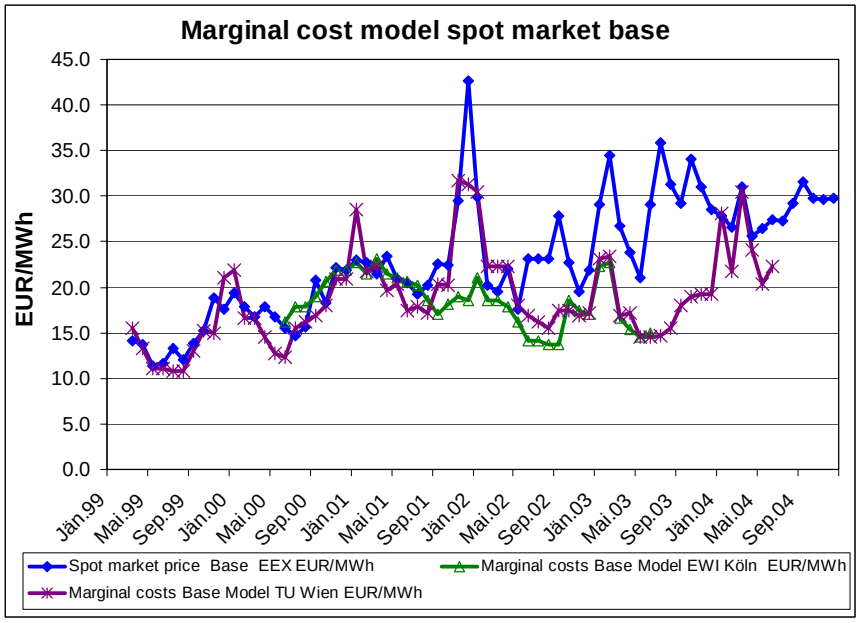
Figure 5.4. Evolution of electricity prices in CE 1999-2005 (Source: Homepages of the power exchanges)



Therefore a major question is, are these prices a result of competition? That is to say, do these prices reflect the marginal costs of the generation set or are they influenced by some kind of market power.

As e.g. Muesgens (2004) shows from 2001 to 2003 in Germany, the difference between wholesale electricity prices and short term marginal generation costs have increased continuously, possibly due to increasing exercise of market power, see Fig. 5.5. It compares with the historical data marginal cost model. As can be seen since 2001, the gap between prices and short-term marginal costs had been continuously widening until 2003.

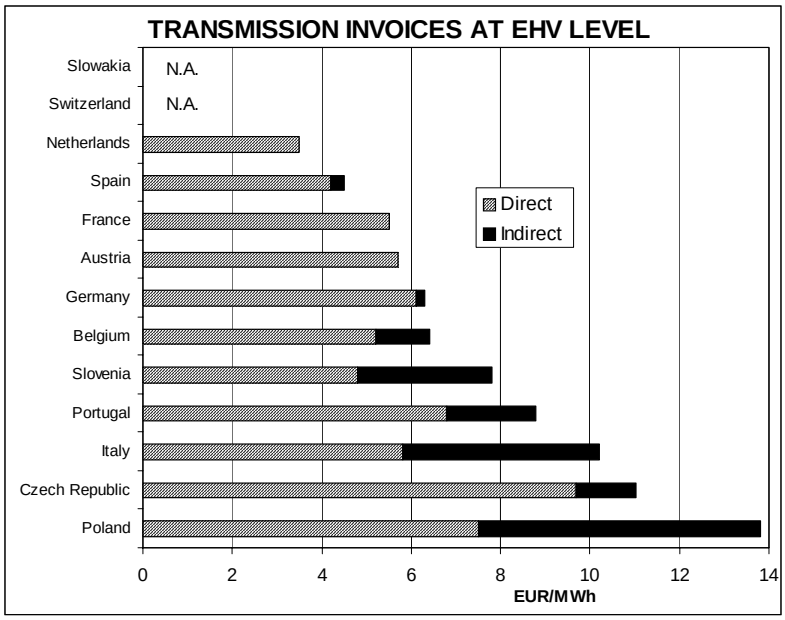
Figure 5.5. Price evolution in Germany and marginal cost models (Source: EEX, Müsgens (2004), own investigations)



5.4 Transmission prices

Transmission and distribution tariffs represent a significant share of final customers' electricity prices but are not subject to competition pressures. Figure 5.6 compares the prices for transmission within the EU countries. These prices vary considerably: between 3.5 Eur/MWh in the Netherlands and 13.8 Eur/MWh in Poland. These huge differences are currently still under investigation (ETSO (2005)). As can be seen from Fig. 5.6, one important part of the tariff is the "indirect component" which reflects burdens like stranded costs, public interest contributions, fees to promote renewable energy and others. The indirect cost component contributes to almost 50% of the transmission price in Poland and Italy.

Figure 5.6. Comparison of transmission prices for producers and consumers connected at EHV (Source: ETSO 2004, national regulators)



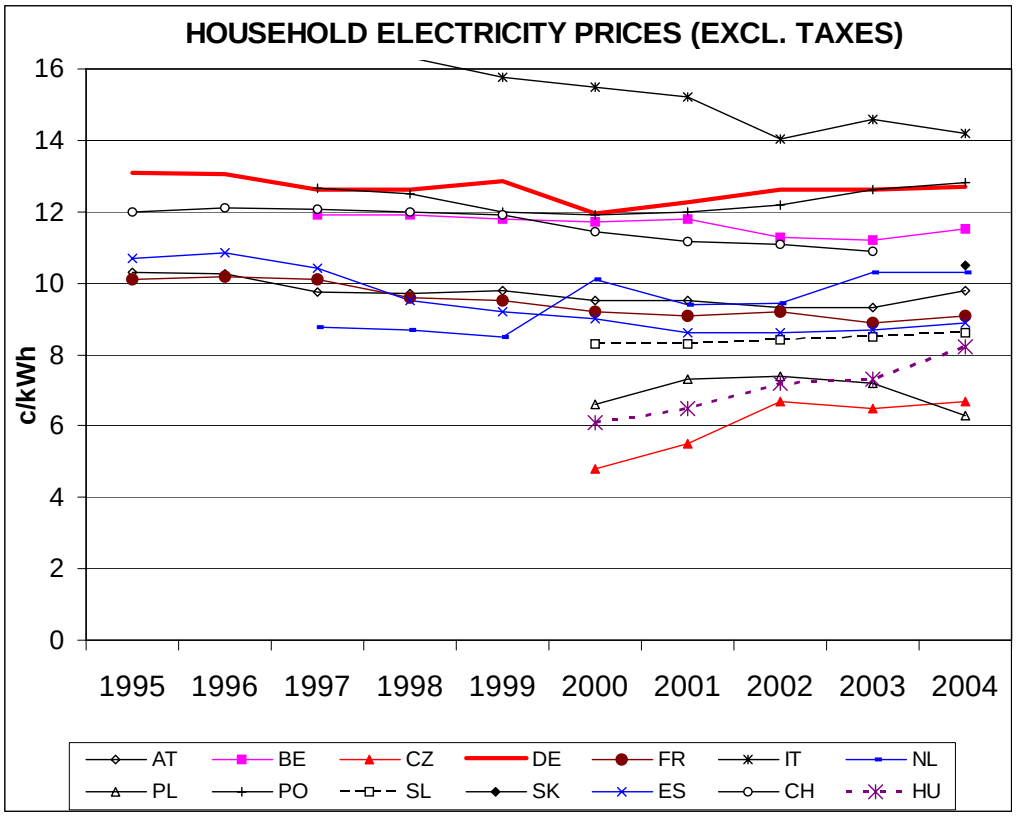
5.5 Retail electricity price evolution

The major expectation of final customers, with respect to the liberalization of electricity markets, was that prices would drop substantially. Figures 5.7 and 5.8 depict the price evolution in CE from 1999 to 2004 for households and large industrial customers. As can be seen from Fig. 5.8, large electricity users were seeing – at least temporarily – indeed lower prices. Yet as Fig. 5.7 shows households electricity prices in 2004 had already reached the same level as pre-liberalization, or were even higher. With the exception of Poland (and for most countries even earlier) prices have been increasing since 2003. Moreover, neither for households nor for industrial customers did any remarkable convergence in prices take place. This was one of the expectations of the common European market.

Figures 5.9 and 5.10 show that for both groups of final customers a wide range of price levels still prevails in different member states[10]. The prices for households vary between 8 cEur /kWh in Poland and 16 cEur /kWh in its neighbor country Germany. Electricity prices for industry range from 4.1 cEur /kWh in the Czech Republic to 10.3 cEur /kWh in Italy.

[10] A sound comparison of prices over ten years would require the expression of them in real terms because of different rates of inflation. Obviously this is difficult for so many countries. Another caveat remains: EUROSTAT figures are based on tariffs, whereas this may have given a valid representation during time of monopoly, it does not after liberalisation because new pricing schemes outwith the former regulated tariffs haven been offered with the tariffs representing the maximum. Hence the figures cannot give the true picture of the development. This is particularly true for large scale consumers. They have many options for buying electricity. Private contracts may not be represented in EUROSTAT figures, and therefore may give a slightly distorted picture.

Figure 5.7. Evolution of households' electricity prices in CE excl. taxes ((Source: CEC (2004), CEC (2005), IEA (2005) based on EUROSTAT Dc, average electricity consumption: 3500 kWh).*)



*) Note that the situation for Italy is specific. Average consumption is lower than 3500 kWh/yr and electricity prices for lower consumption are significantly lower (about 40%).

Figure 5.8. Evolution of large industrial customers' electricity prices in CE excl. taxes (Source: CEC (2004), CEC (2005), IEA (2005), based on EUROSTAT Ig, average electricity consumption: 24 GWh).

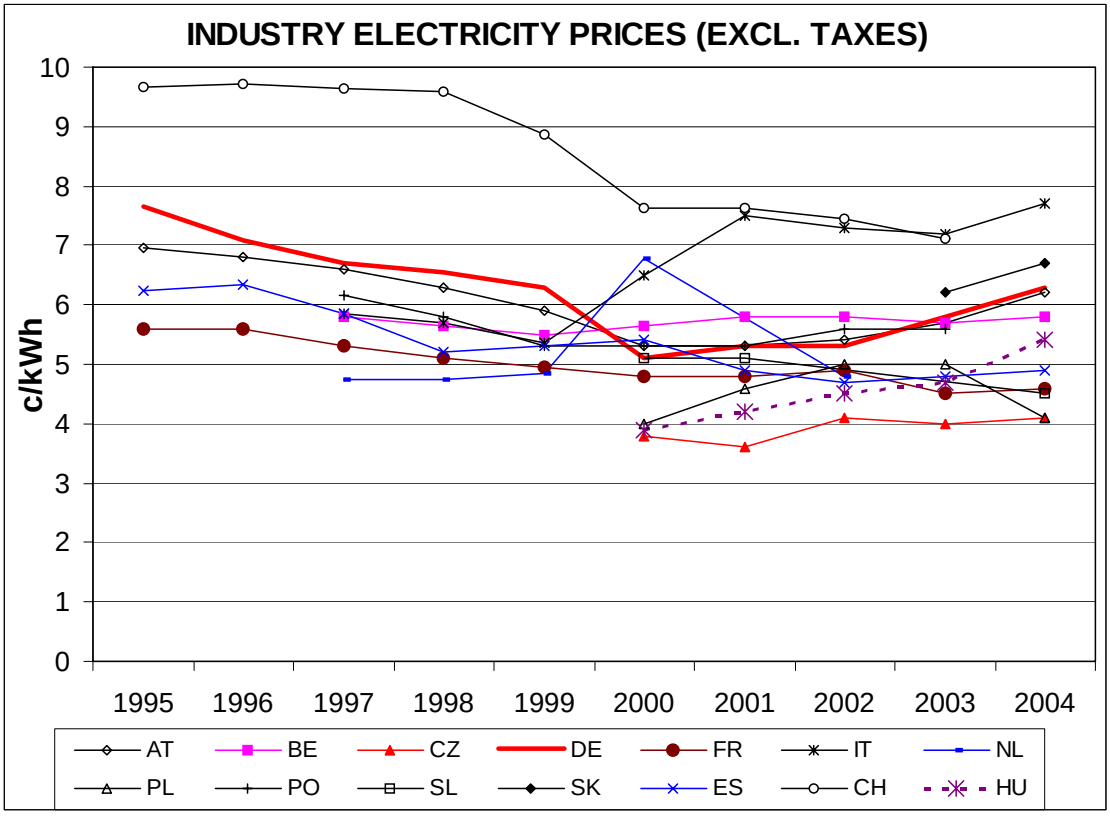


Figure 5.9. Household electricity prices in CE in 2004/2005 (based on EUROSTAT Dc, average electricity consumption: 3500 kWh). (Source: CEC (2005), EUROSTAT (cited from Power in Europe), IEA (2005))

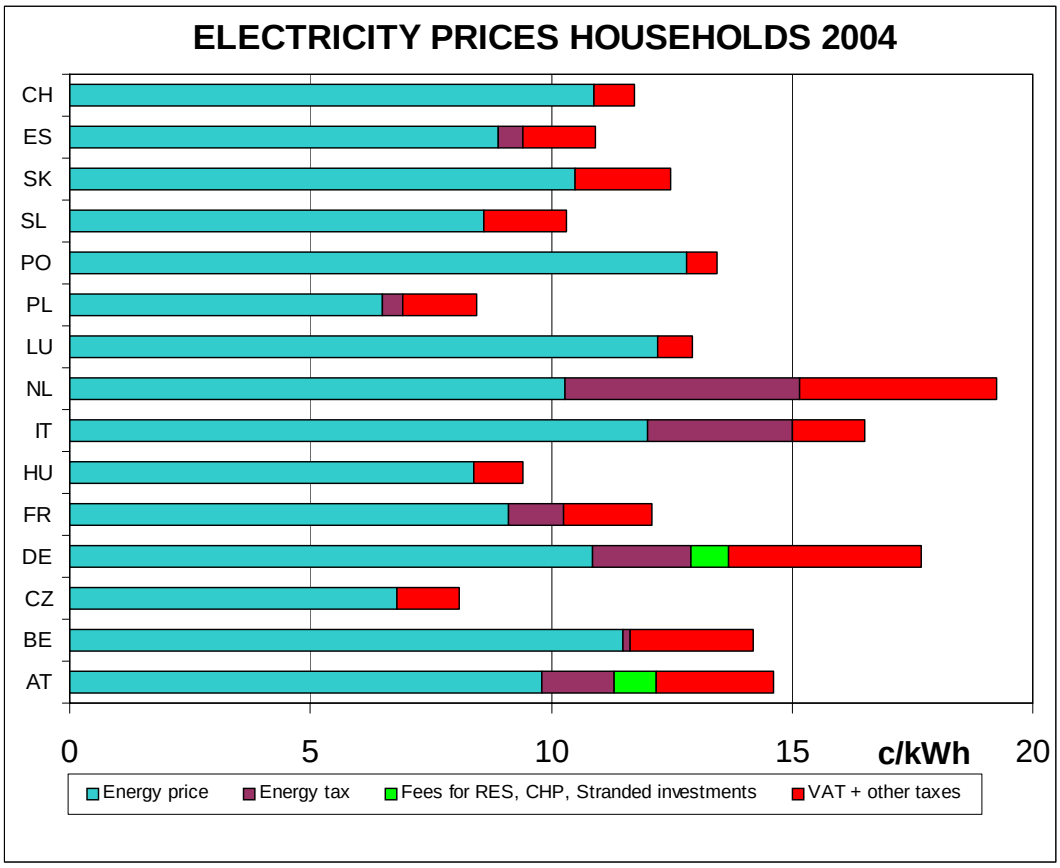
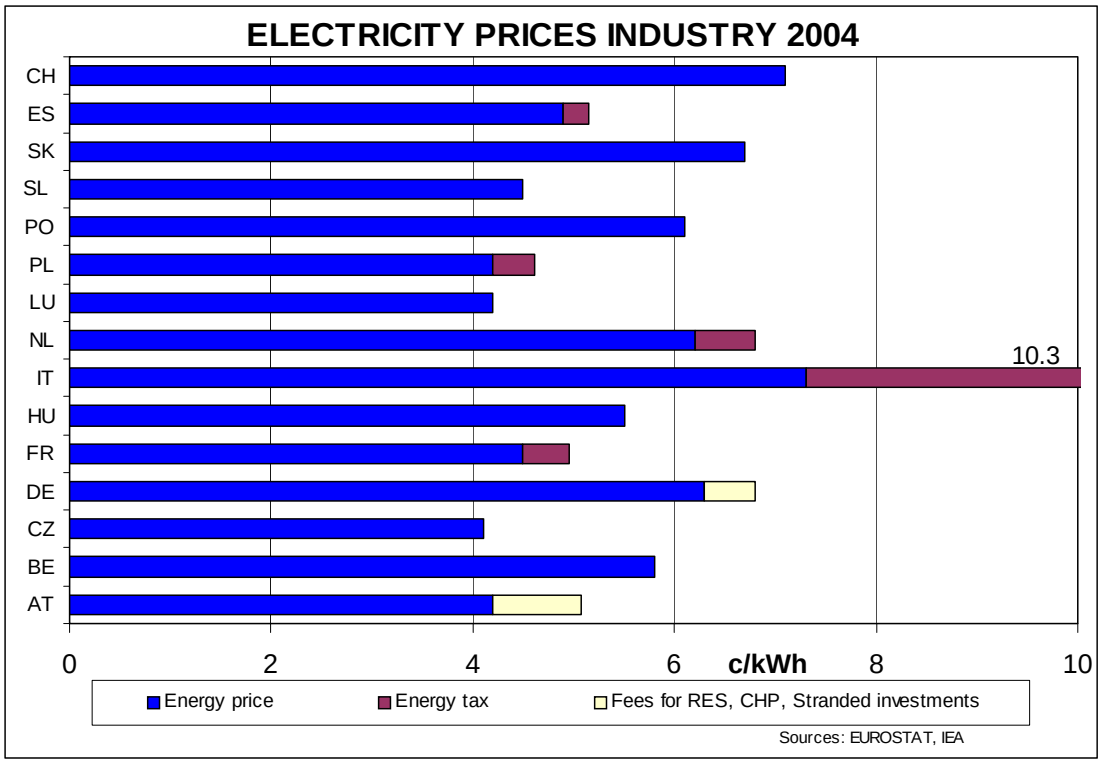


Figure 5.10. Industry electricity prices in CE in 2004/2005 (based on EUROSTAT Ig, average electricity consumption: 24 GWh). (Source: CEC (2005), EUROSTAT (cited from Power in Europe), IEA (2005))



Of course, there are many reasons for price increases and outside competition effects, e.g. transaction cost of market creation e.g. splitting of distributor into two legal companies - for distribution and for supply, new power plants that have to meet new ecological legislation (emission limits, minimum thermal efficiency etc.), which will mean utilization of expensive technologies (especially in Eastern Europe), emission allowances for CO2, consumer tax imposed to fossil fuels from 2007 (according to EU rules), fees for increasing share of RES-E production. Figures 5.7 to 5.10 require more in-depth investigation.

5.6 Evolution of capacity margin

As in many liberalized electricity markets, many CE countries started this process with significant excess capacities in generation which had been built up during the time of regulated area monopolies. This was a common motivator and driver for competition introduction. Yet, excess in generation capacity played a central role in the restructuring process of ESI. Excess capacity in generation depends on transmission capacity - the price competing utilities receive for electricity will be equal to their short term marginal cost. Under perfect competition conditions without any remarkable excess capacities, the price should be equal to the long-run marginal costs (LRMC). But if there is no competition or a too tight capacity the price can be substantially higher than both marginal costs, especially when demand is not true to price.

As Fig. 6.1 shows in recent years excess capacity decreased continuously in CE sub-markets (spare capacity = net capacity minus maximum load).

Another important issue regarding the availability of adequate generation capacity is the volatility of hydro power. As Fig. 5.11 shows for the major CE hydro countries, hydro power availability varies tremendously over time. Moreover, in countries like Austria, Switzerland and France the differences are very similar. Furthermore, in winter months the minimum production in the long run is only half of the maximum.

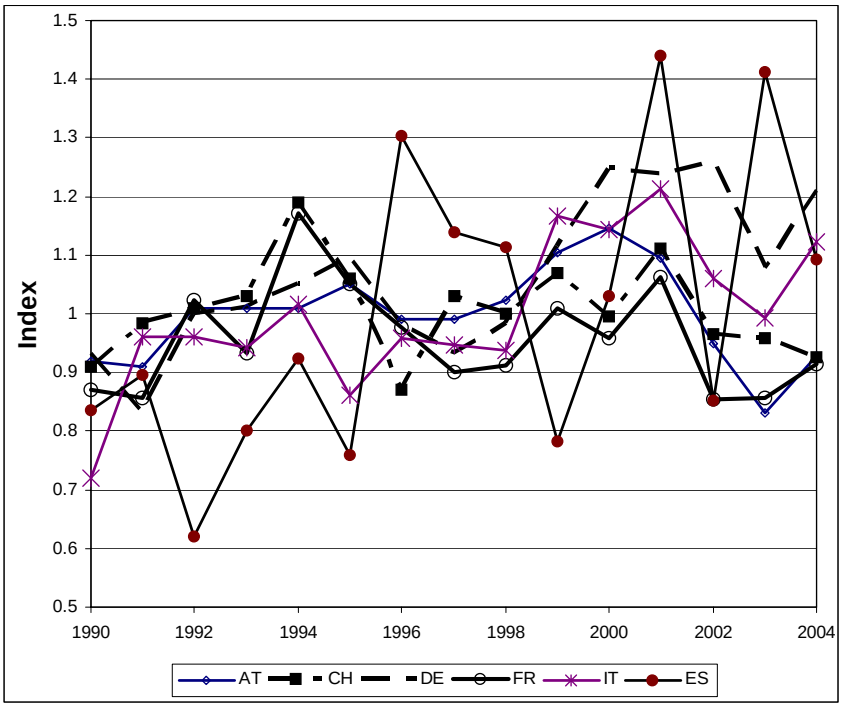


Figure 5.11: Annual variation of Hydro Power availability in CE hydro power countries (Source: UCTE and own Investigations)

5.7 Cross-border transmission issues

The share of cross-border exchanges in European electricity consumption reached about 13 % or total sum of 300 TWh in 2004. However, the volume of exchange was limited by the transmission capacity between neighbouring grids.

As Glachant et al (2005) notes, many interconnections are managed by administrative rules without market economic bases. Roughly half of inter-connections between countries of Continental Europe were being managed that way in late 2004.

To manage this limited transmission capacity, different approaches are applied. The most important ones in EU countries are:

- Priority list (First come, first served; then “grandfathering”);
- Pro-rata rationing (Capacity is allocated in proportion to request if they exceed available capacity);

- Auctions (The TSO accepts bids from potential buyers and allocates the capacity to the ones that value it most).

Table 5.4 depicts the type of congestion management methods for the most crowded EU borders. As can be seen from Table 12 currently there is a wide variety in methods. However, as the European association of TSOs -ETSO (2004)- states, "*The Regulation 1228/2003 … on 'Conditions for access to the network for cross-border exchanges in electricity' clearly states that the implementation of market-based congestion management methods are preferred*".

Table 5.4 Type of access to cross border transmission capacity
Source: ETSO 2005

Connection	Type
FR – DE / DE - FR	Priority list / Pro-rata /Partly auctions
AT – DE / DE – AT	Priority list
NL – DE	Auction
DE – NL	Auction
FR – IT / IT – FR	Pro-rata
FR – BE / BE – FR	Priority list / Pro-rata
NL – BE	Auction
BE – NL	Auction
FR –ES	Priority list
ES – PO / PO – ES	New method foreseen
SK – HU	Auction
SL – IT	Auction (short term), Pro-rata (long term)
CZ – AT	Auction
CZ – DE	Auction
AT – IT	Pro-rata

Figure 5.12 Installed gross generation capacity, Net Transfer Capacity (NTC) for transmission and import capacity as percentage of installed generation capacity in CE countries. Source: CEC (2005), UCTE (2005).

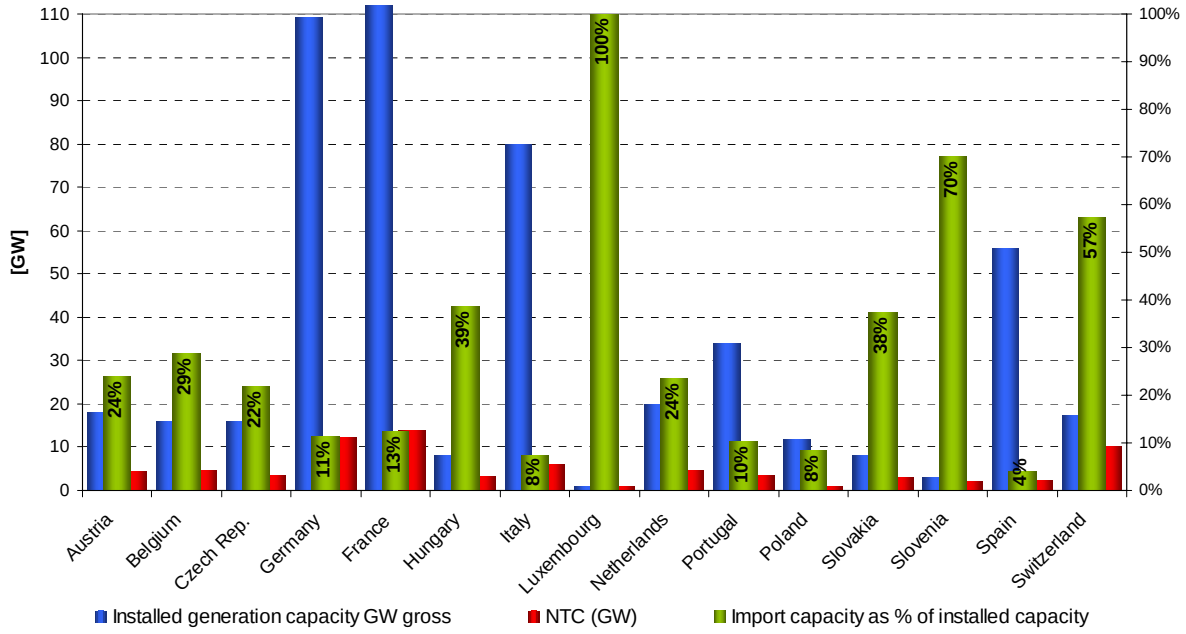


Fig. 5.12Fig. 5.12 shows installed gross generation capacity, NTC for transmission and import capacity as percentage of installed generation capacity in CE countries. It clearly shows that the import capacity as percentage of installed generation capacity is highest in the smaller countries. This figure also reveals the strategic relevance of Switzerland as a transit country. In absolute terms Switzerland has the highest NTC aside from the largest countries Germany and France.[12]

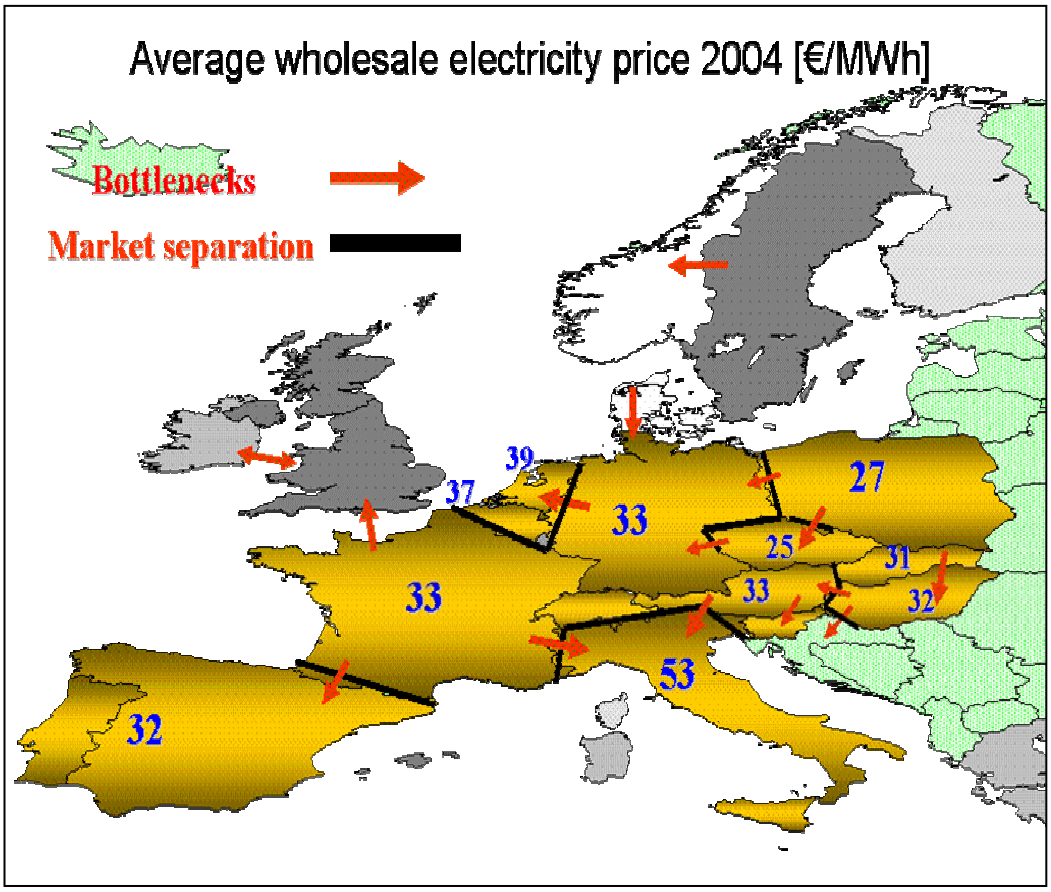
In Eastern countries many international transmission lines are currently being[13]congested by long-term contracts which are taking up much of the potentially available capacity and can reduce the potentially competitive impact of market opening.

Fig. 5.13 exhibits the major cross border bottlenecks and documents the corresponding wholesale spot market prices in 2004.

[12] "Cross-border trade" is not necessarily correlated with "enhanced competition": when the oligopolies own plants in several European countries, and exchange power between their subsidiaries, it might not contribute to more intensified competition.

[13] Most of the transmission lines between countries are frequently congested, particularly those towards the importing countries of Austria, Germany and Hungary.

Figure 5.13.Transmission grid bottlenecks and wholesale electricity prices in Europe 2004



6 FUTURE OUTLOOK: PRIORITIES FOR IMPROVEMENTS

Today, the European Union has successfully initiated the most extensive and ambitious project for building a new electricity market. But there are no guarantees that the dynamics of this construction will not, as in the United States, dissipate, or that the internal market will not remain fractured in "national or local blocks" which may persist for a long time (Glachant & Lévêque 2005; Glachant & Finon 2005). Moreover, as has been argued by (Haas et al (1997) and Haas/Auer (2001)) the expectation of lasting competition in a "free" market is based on very simplified assumptions of the strategic behavior of electricity generators and network operators. The caveats described by Banks are similar (1996) ("*the market is a wonderful thing and it should be exploited as far as possible but it also has its limits*") and Newbery (2002) that are based on the experience in the UK and the Nordic market (Norway, Sweden…).

Currently, the major obstacle for a European common market is the general lack of competition in virtually all local and national wholesale, as well as retail electricity markets, because the number

of competitors is too low, or because barriers to entry and incentives to collude remain too high[14]. These aspects are further reinforced by (at least) two others: 1, Insufficient transmission capacity availability between the submarkets, and 2, the increasing horizontal integration with natural gas supply.

Hence, the paramount objective is still to construct competitive markets,while – at the same time – ensuring a reasonable level of grid reliability and adequacy of supply

6.1 Access to the market

One major priority for improving access to the EU grid is the regulation of the TPA in Germany. Pfaffenberger et al (2004) emphasizes this issue, especially for Germany, which has so far not regulated access to the transmission grid.

The next priority is to obtain non-discriminatory, open, and competitive balancing arrangements. Balancing arrangements may not handicap the arrival of new entrants or existing operators which are not vertically integrated; and they should be open to all potential competitive sources of supply (Glachant & Lévêque 2005).

Another important issue is transmission pricing. A harmonization of national access pricing schemes and cross border pricing would contribute to lower transaction costs in international competition. This problem could be alleviated by reinforced regional cooperation agreements between TSOs (creating "virtual RTOs"). TSOs should not be authorized to stand as "national guards" protecting only the activities and interests of their historical zones of operation. Therefore all TSOs wishing to play an active role on the regional level should be encouraged to engage in strengthened cooperation in order to smooth the functioning of the internal market. In order to do so, criterion for evaluating Europe's economic interest in grid interconnections would be a crucial tool. It is untrue that only bilateral national interests form a legitimate basis for identifying and evaluating interconnection projects useful for expanding the EU internal market. Thus, we must seek criteria for evaluating a pan-European interest in these interconnections (Glachant & Lévêque 2005).[15]

6.2 Remedies in restructuring utilities

Of course, an easy solution with respect to the number of generators in each relevant market would be to have more generators and some divestment. Whatever the theoretical difficulty in

[14] E.g the European heavy industry association writes in its 2004 electricity market design report: "*Competition between European power generators and suppliers has virtually disappeared depriving industrial customers of any negotiating power when seeking new supply contracts*" (PiE)

[15] We can also think on secondary paths for improvement of TSOs work by extending the independence of TSOs; encouraging the harmonisation of grid access and connection fees; and last by encouraging TSOs to develop joint forecasts and planning.

designing these structural remedies (Smeers 2005), there are currently no signs in any country which point in this direction. Most European governments like playing national champions and national mergers.

Another issue is that privatization is often seen as being more important than carefully designed competition mechanisms. However, as Newbery (1998) asserted for England, "*competition rather than privatization is the source of the benefits*". And, under competitive pressure public utilities performed reasonably in the Nordic countries.

Of particular relevance in this context is the ownership future of EdF. The privatization of EdF has been under discussion for years, and it could start in the Fall of 2005. However, given the limited number of generators engaged in this market, it is unlikely that a partial privatization of EdF would add much to the French "fringe competition" (Glachant & Finon 2005).

6.3 Refining the regulatory or the market design

In some countries, changes of the current design are under way. The most important changes appear to be the introduction of a regulator in Germany and a possible structural change of the Spanish market. A further one could be the creation of an organized Western European market which would couple The Netherlands, Belgium and France.

Germany has been installing a regulatory authority in 2005. On June the 17th, the German parliament passed extensive amendments to the existing Energy Industry Act. The government also outlined detailed guidelines on electricity grid access and grid tariff calculation methods. The new act provides rules on legal, operational and accounting unbundling mirroring the provision of the EU Directive (PiE N°455, July 2005). For further details on this issue see Brunekreeft et al (2006).

The second interesting development took place in Spain. In the summer of 2005, the long awaited *White Paper* on the electricity sector was presented by I. Perez-Arrriaga. Although, this document is officially non-binding, it is seen as the 'road map' for the future with radical solutions to reduce market concentration. The *White Paper* is likely to propose a series of measures to limit market domination by the incumbent utilities with the target of increasing tariff transparency, competition and, straightforward, consumer benefit. Furthermore, it suggests virtual divestment of generation capacities. It remains to be seen as to how it will be applied, considering the current take over of Endesa by Gas Natural.

Major changes are expected in Italy and France. This will intensify the use of auctionning in allocating cross border capacity. For the future of the Italian market, the price difference between its neighbour countries will be a key element for the integration of its market into the EU. Many operators are anouncing to get into the construction of merchant lines for the direct import of

electricity. Could this really be an alternative to the construction of new power plants, which is quite difficult in Italy because of the strong local oppositions? France itself could embed the allocation of its northern interconnection capacity in a market mechanism shared with Belgium and The Netherlands. This would couple the three national PXs (APX, Belpex and Powernext) as well as the three TSOs (Tennet, Elia and RTE). If this mechanism were to work well and be cost effective, it could pave the way to further reinforced regional cooperation within the EU, while maintaining –at least for a while- all the existing national PXs and TSOs. (Belmans, Glachant & Meeus 2005)

To enhance competition in Eastern Europe a deeper regional integration could be a way out of this world of currently small, segmented and distorted local markets. A regional approach to market design and restructuring would be an improved solution compared to the national individual approach taken by most countries. Companies that are large on a national basis would be small, or at most medium-sized, on a regional scale. Effective regional markets could offset the limited competition within national markets, but require suitable cross-border and balancing arrangements. The limitations of this approach are, that by increasing the relevant market size all indicators would look better, without any change in competitive settings. Kaderjak (2005) argues, that "…*the finding that local competitive fringes are massive importers even in large exporting countries indicates the outstanding importance cross-border trade may play in further market integration in the region*". Most important for such a competitive fringe are the low transaction costs for access to the grid and to the market place.

An important future impact on the Continental European electricity markets might result from a further extension into other countries in Eastern and South-Eastern Europe. Slovenia is operating in a joint control block with Croatia and parts of Bosnia and Herzegovina. Bosnia and Herzegovina, as well as Serbia and Montenegro and Kosovo, are recovering from war damages and form again an electricity exporting area. Currently, many transmission lines are congested, see Table A-3 (Appendix). Moreover, the situation with respect to competition in the Eastern border countries is not promising. While in Poland and Hungary there are about three large generators, there is only one in the Czech Republic and Slovakia. Yet, it has to be considered that excess generation capacity exist in Poland, Czech Republic, (Fig. 2.5) Bulgaria, Romania and Ukraine (see Auer et al, 2005). Hence, if the transmission system is extended in and between the crucial countries along the former EU-15 countries easterly border, there could be the chance for an extension of the current Central European market to the East.

Therefore a core issue in improving the "EU Internal Market Design" is congestion management at interconnections. In practice, European interconnections are always treated like borders, and their congestions result from domestic decisions and priorities decreed separately in each Member State. There is no comprehensive operational cooperation to minimize congestions at the borders, or to

maximize the capacities available at the interconnections (Glachant & Pignon 2005). A possible engine to do so is voluntary regional agreements. Since the institutional framework makes it difficult to quickly establish a fully operational regulation covering the entire European Union, pursuing comprehensive voluntary regional agreements could constitute an excellent auxiliary engine for the current phase[16]. Moreover, during the current phase, let's say 2005-2009, construction of the internal market could continue to advance in a decentralized framework in which national regulators could play a key role. We may consider that the problems of the internal market can best be addressed where they actually arise, which is what regulators already know how to do within their "national blocks". Problems of unification and convergence between Member States are most pertinent where trade is greater, interconnections most sought after, and wholesale market prices already tend to converge. Voluntary regionalization of convergence between some pioneering "national blocks" thus appears to be a promising step in the right direction during the current phase (see Glachant & Lévêque 2005).

Finally, it must be emphasized that the minimum requirement for more competition in the EU electricity markets is increased transparency concerning power plants and amounts generated. This relevant market information must be made available to all market participants in a simple way at low costs. As Pollitt and Jamasb (2005) state, "*In the post-liberalisation era, some types of data have been deemed commercially sensitive and are not made available even to regulators. There is a need for adequate disclosure, more transparency, and the collection and publication of new types of data. … Improving the quality of data requires joint efforts and agreement on types of data needed, collection methods, and standard reporting formats*"[17]. Moreover, the issuing of licenses for generators (Newbery (2002)) could ensure more transparent capacity availability and avoid sudden bottlenecks in generation.

6.4 Perspectives for adequacy, reliability and security of supply: generation and transmission capacity

As argued in Section 4, the development of adequate capacity in generation is most important in this context, and the question as to how capacity margin is distributed among generators Fig. 6.1 depicts the currently looming developments of load and generation capacity[18]. This picture is not the same in different countries. In Italy, load has already surpassed available net capacity. In Spain &

[16] : Harmonisation—especially regional— is here a crucial issue : Harmonisation of transactions so as to open a European bilateral market ("European purchases and sales passport"); Harmonisation of transactions for reciprocated opening of organised markets ("virtual EuroPX"); Harmonisation of rules for reciprocated opening of balancing mechanisms ("Balancing club"); Harmonisation domestic mechanisms for fostering priority energy sources see (Glachant & Lévêque 2005).

[17] De Jong et al provide a comprehensive discussion and a detailed overview on transparency in European electricity markets. They show that especially the information on the availability of power plants is very poor in CE.

[18] The figures for load forecast are taken from UCTE (2005). The figures for the trend in generation capacities are based on existing capacities, approved new capacities, decommissioning of nuclear due to IAEA and a limited lifetime of fossil plants of 40 years

Portugal the danger of shortages exists (Alba (2003), (Crampes & Fabra (2005): "*With no plant entering into operation from 1998 to 2002, and a steep increase in demand … the system has indeed been operating below acceptable adequacy since 2000*"). In Western Europe (FR, DE, CH. AT) the current trend implies generation capacity needs by 2007 or 2008.

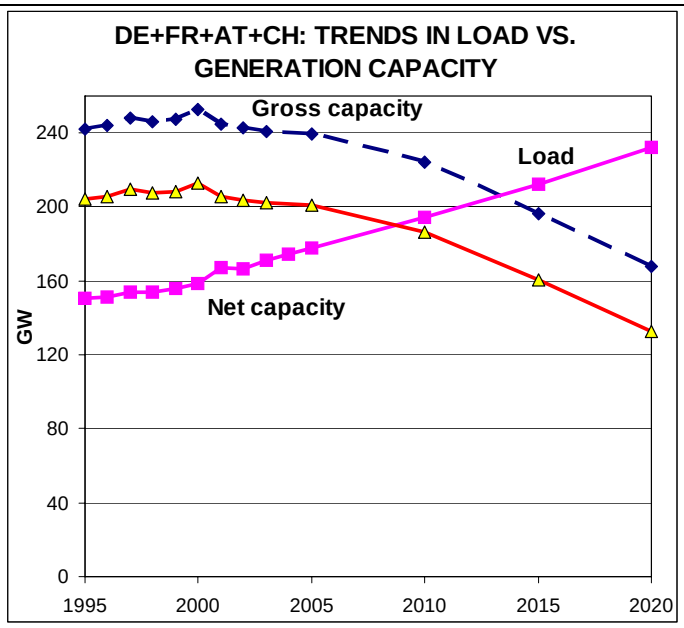


Figure 6.1a: Current and future trend of generation capacity and load in Western Europe

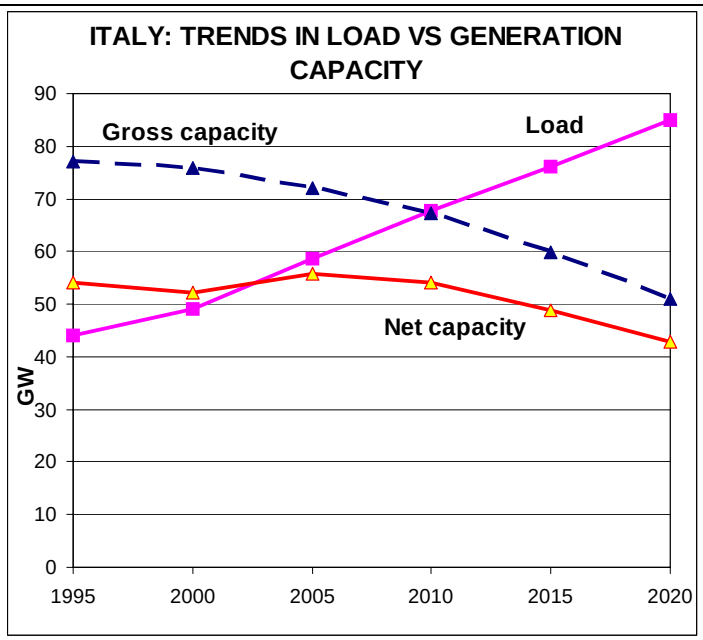


Figure 6.1b: Current and future trend of generation capacity and load in Italy

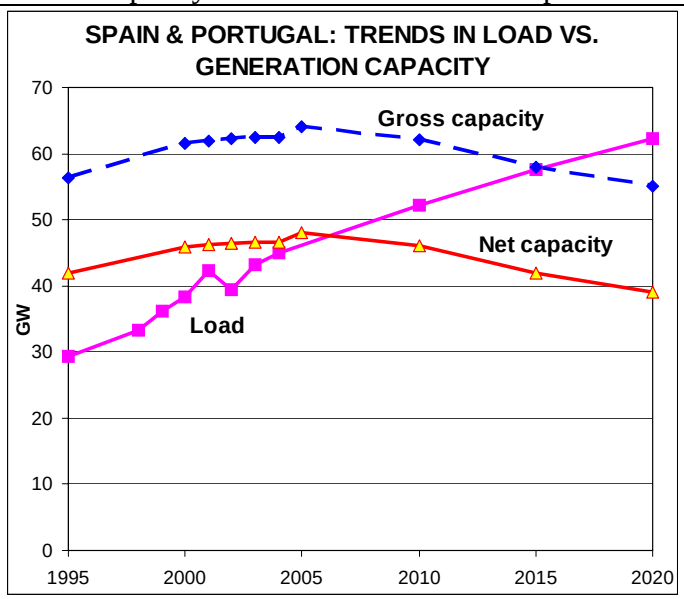


Figure 6.1c: Trends of generation capacity and load on the Iberian peninsula

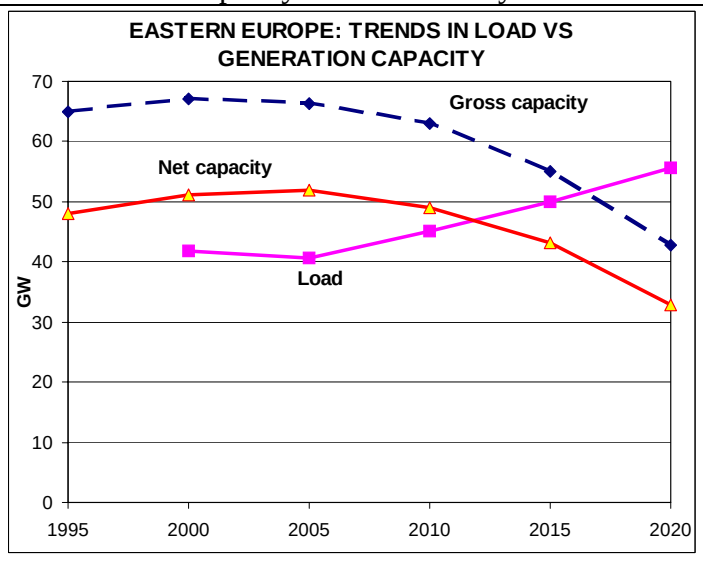


Figure 6.1d: Trends of generation capacity and load in Eastern Europe

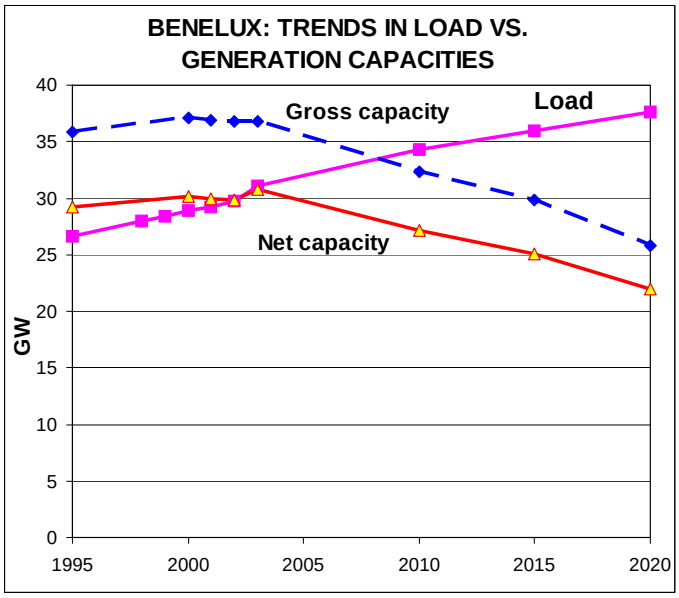


Figure 6.1e: Trends of generation capacity and load in Benelux

Eastern Europe (CZ, HU, PL, SK, SL) has adequate generation capacity for the foreseeable future, and will continue to be heavily inclined towards coal and nuclear power. Furthermore, domestic production of coal would make it politically awkward to reduce the share of coal-fired generation, despite environmental concerns. It seems that necessary environmental investments will be covered by customers through electricity price increases. As most of the power plants, like the coal companies, are still state owned, they are not much interested in switching to other fuels like gas. Additionally, higher gas prices are not attracting many investors. Nuclear power is controversial, but does have environmental benefits in a carbon-constrained world. Concerning the limited support for renewable generation, regulatory and political uncertainty has also prevented more than small-scale deployment of renewable technologies. The one remaining major uncertainty in Eastern European countries is the magnitude of demand growth.

Another important prerequisite for a sufficiently wide market is the sufficiency of transmission capacity for neighbor regions, and the increasingly number of potential competitor generators. Currently, transmission constraints are having a substantial impact on the separation of sub- markets in Continental Europe. Hence, the basic conditions to bring about a European-wide electricity market are an extension of the grid at its bottlenecks[19], and a non-discriminating, open and comparable access to the transmission grid at reasonable non-pancaked rates. Or, as Newbery (2003) puts it "... *to rapidly increase transmission capacity offered at efficient prices*".

[19] Yet, extending CB TM capacities faces – aside from potential acceptance problems – two other conditions: (i) Who will invest? (ii) How can the recovery of investments be ensured?

6.5 The future of regulatory governance

As Newbery (2002) states "(so far) *Appropriate regulation has been largely ignored by the Commission and many EU countries, but without it, there are serious risks that the benefits of liberalization may be lost, and the political costs of flawed outcomes may undermine support for reform.*"

The current European regulatory governance is a decentralized framework that is essentially national and in an incomplete process of convergence. If there were to be only one way of implementing competitive reforms, or only one way of transposing the First and Second EU Directives, then this decentralisation would simply capture economies in transaction costs. Referees would be better and more cost-effective if they were to remain on the field until the end of the game, rather than changing country at halftime. However, there are several legitimate paths to competitive reform. And there are yet other paths, if less legitimate, but still legally possible, owing to this very institutional decentralisation and the "flexible" compromise that is characteristic of European directives.

Nor is there featured, within the European context, a centralised regulator who could create additional complementary rules to steer national rules towards convergence, or a federal regulator with the power to legitimise national rules ex ante or launch ex post reviews for decisions taken on the ground (see Glachant & Lévêque 2005). Thus, pan-European convergence between national blocks is being sought by other means. The best known is the process of voluntary agreements between the stakeholders: the Florence Forum, the Madrid Forum. This is a self-regulatory process, but different from the German one since it integrates national regulators. Relevant authorities and stakeholders voluntarily meet to establish principles or rules that, though not binding, delimit a "code of good conduct". Nevertheless, when the underlying dynamics appeared to have lagged, the Commission sought to re-boot it with a Second Directive (and regulation; in 2003) which contained national divergence and bolster convergence.

Table 6.4 depicts the competences and the power of the regulators in CE countries in 2004 based on Green et al. (2005). It can be seen that no regulator scores with the maximum of power (6). The major power curtailments are the limited power to enforce competition and the still widely prevailing ministerial involvement[20].

[20] In Germany and Switzerland no regulator existed in 2004.

Table 6.4. Competences and power of the regulators (Source: CEC (2004), CEC (2005) personal national information)

	Power to enforce competition **(Yes=Strong)**	Ex-ante/ Ex-post **(Ex-ante =Strong)**	Ministerial involvement **(No = Strong)**	Power to regulate the network access **(Yes=Strong)**	Power to settle dis-putes **(Yes= Strong)**	Power to aquire infor-mation **(Yes =Strong)**	Summary: Number of strong (Max: 6)
AT	Advisory	Ex-ante	General guidelines	Yes	Yes	Yes	**5**
BE	Advisory	Ex-ante	No	Yes	Yes	Yes	**5.5**
CZ	No	Ex-ante	No	Yes	Yes	Yes	**5**
DE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**
FR	Yes	Ex-ante	Tariff approval	Yes	Yes	Yes	**5**
HU	Advisory	Ex-ante	Tariff approval	No	Yes	Yes	**4**
IT	Advisory	Ex-ante	General guidelines	Yes	Yes	Yes	**5**
LU	No	Ex-ante	Yes	No	Yes	Yes	**3**
NL	Yes	Ex-ante	Instructions	Yes	No	Yes	**4.5**
PL	Advisory	Ex-ante	Supervision	Yes	Yes	Yes	**5**
PO	Advisory	Ex-ante	No	Yes	Yes	Yes	**5.5**
SK	No	Ex-ante	No	Yes	Yes	Limited	**4.5**
SL	Advisory	Ex-ante	Non-eligible	Yes	Yes	Yes	**5**
SP	Advisory	Ex-ante	Yes	No	Yes	Yes	**3.5**
CH	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**0**

The European Union still appears to be in its infancy in matters of detecting and remedying market power in the field of energy. The sector enquiry started by the EU Competition Authority in summer 2005 was then the very first step in a more systematic approach to the many particularities of market power in the electricity industry. A more or less permanent arrangement exists for detecting market power in some of these markets in a few countries of the European Union—but not in all of them—and even more rarely, is an array of organised remedies (Glachant & Littlechild 2004). The implicit assumptions appear to be that either:

* Existing markets function sufficiently well and ongoing monitoring would be a waste of valuable time on a non-priority activity; or

* Detecting and correcting eventual anomalies is not very difficult, so that any problem will reveal itself spontaneously in a timely fashion.

To go further in monitoring and mitigating market power, it would be useful to ask the European Competition Authority to create with national Competition Authorities and regulators having authority (many of them have no power in the competition area) a European market surveillance network sharing the data, the tools and the knowledge.

Finally, European regulatory could also be enhanced. We think that a good workable solution would be to encourage bilateral and regional harmonization agreements between regulators[21]. National regulators currently hold the institutional keys for the resumption of regional construction in the internal market. Notably, they have the competencies to combine significant advances on the regional scale with the true constraints of the national level. The Commission's challenge will be to motivate them in the mobilization of these competencies for the benefit of the Community rather than for the status quo. One of way of doing this is to develop pan-European regulatory knowledge and training in the European Union. The time has come to organize the expertise of regulatory personnel on the scale of the European Union, whether it be to disseminate existing knowledge to improve the yield to investments in human capital or to increase the efficiency of regulation (see Glachant & Lévêque 2005 [22].

6.6 The future of environmental issues

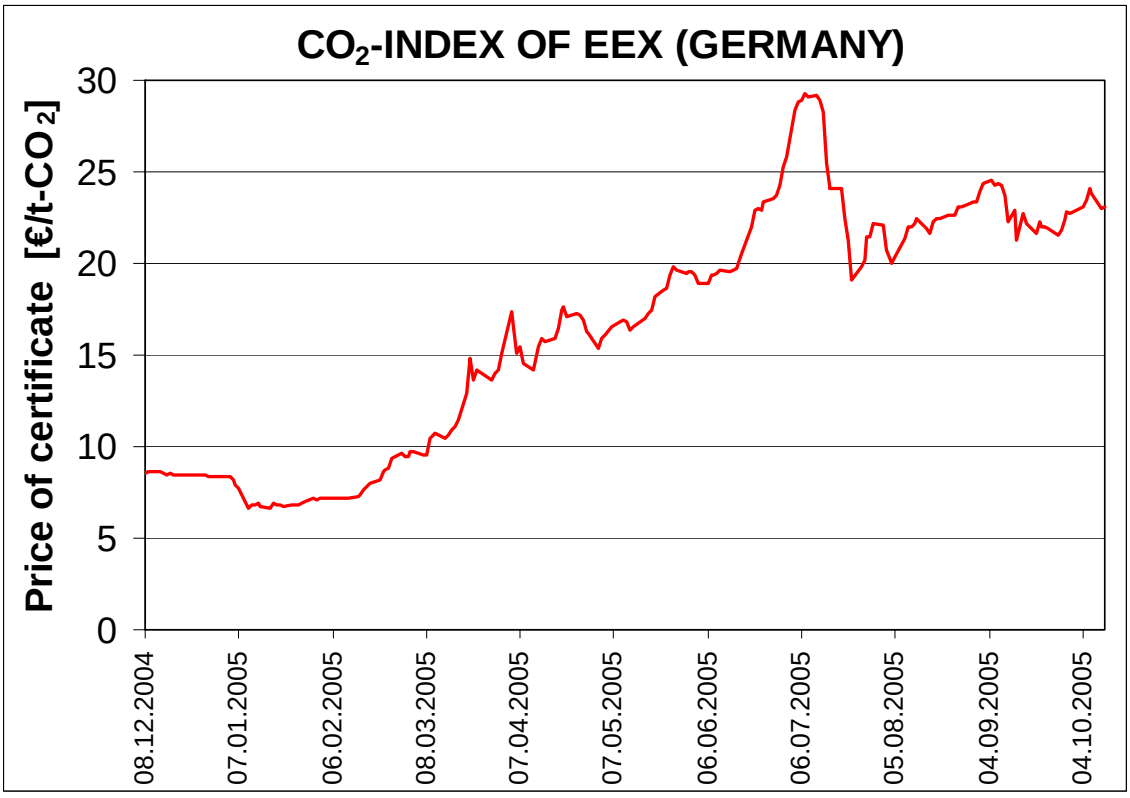
There are three fundamental environmental issues with respect to electricity markets in CE: energy taxes, emission trading, and the promotion of Renewable energy sources.

Energy taxes on electricity consumption for households exist in most CE countries. There are no signs of significant changes of this instrument. Emission trading in CE countries started in 2005. The first major response was quite a steep increase in CO_2 certificate prices, and later on, electricity prices, Fig. 6.2 and Fig. 5.4. Of course, electricity prices will be influenced by the the market price of CO_2 certificates. (For further details on CO2 matters see Brunekreeft et al (2006). It is still too early to say to which extent.

[21] : Rules for reserves and balancing, access to interconnections and congestion management, joint approval of investments in the grid, etc

[22] The European University Institute in Florence is already a reference point for European regulation and a meeting place for the EU regulators, and could provide the basis for an ambitious project.

Fig. 6.2. Prices of CO2 emission certificates in CE 2004-2005 (Source: www.eex.de)



Two major open questions still exist with respect to RES electricity generation.

Firstly, will the EU finally come to the conclusion that a harmonization of different promotion schemes is preferable? So far, countries with feed-in tariffs (Germany, Spain, Austria) have been performing much better in adding more capacity .than countries which have been relying on TGC-based quota systems (UK, Belgium, Italy)

Secondly, will the EU stick to ambitious targets for the period after 2010, despite the non attainment of certain countries concerning targets for 2010?

6.7 Summing up: Perspectives for delusion or for competition?

To bring about the EU's goal of effective competition in a **single** integrated European electricity market and to avoid market power, the following structural conditions have to be fulfilled:

- Complete ownership separation of the grid from generation and supply in all EU countries;
- Adequate transmission capacity for connecting the single sub-markets thus creating a larger market with more potential competing players. This is also important for a continuing integration of Eastern and Southern-Eastern European countries. Of course, most ideally, would be a harmonized system which provides the same conditions for national and cross-border electricity exchanges.

- Adequate spare capacity in generation: Now, it is of importance that incentives for investments in sufficient capacity are provided by the markets and encouraged by the regulatory authorities. Note that adequate capacity can also be brought about by proper demand-side load management, in particular by smart metering which would allow for new forms of demand responsiveness.
- Adequate spare capacity in generation is not enough if concentration is too high; therefore actual disinvestment as well as temporary "Virtual Disinvestment" (= *Virtual Power Plants by auctioning rights to dispatchable energy*) could restructure the generation sector, so as to be sure that more generators and more suppliers can compete, even at the fringe, in every single submarket.
- Full market opening in all countries (notably by ending uncompetitive vested contracts, and by establishing a sensible temporary price control for incumbent monopolies).

We know that these conditions look like a wishful Christmas list, but none of us prefer nightmares.

7 CONCLUSIONS

While the liberalized CE electricity market is still under construction, some conclusions regarding developments so far can already be drawn.

- Firstly, liberalization in CE started about a decade after the advances made in the UK and Norway. However, it seems that the CE countries did not learn much from their experience regarding conditions for competition. Instead of divesting generation capacity and increasing the number of competitors (as recommended by Newbery & Pollitt (1997)) most countries pursued mergers (DE, NL), retained oligopolies (NL, ES, AT, CH), private monopoly (BE), or supported the concept of national champions (PO, FR). Only Italy has chosen a quite different strategy of divestment of the former national champion ENEL.
- Secondly, the CE electricity market is the largest regional market in Europe, and its geographical position implies that further progress towards an integrated electricity market in Europe will depend strongly on the development of this market (Politt and Jamasb (2005)). France and Germany play a key role within this market because of their size and geographically central positions.
- Thirdly, the major obstacle for a common market that works reasonably, is currently, a general lack of competition in virtually all local and national wholesale as well as retail electricity markets. The number of competitors is to low, or barriers to entry are too high, or incentives to collude are too high. This aspect is being reinforced by two others:

insufficient transmission capacity is available between the submarkets; an increasing horizontal integration with natural gas supply.

- Fourthly, the European Commission itself is in an ambiguous position. On the one hand, it still advocates the goal of a European-wide common electricity market, by the year, it is said, 2012. On the other hand, only very weak light-handed measures are being implemented on the European scale. One of the major problems is still, and will be, that the market power of the large – and still growing – incumbent generators cannot be tackled by the European Commission alone because it cannot ask for deep structural or regulatory remedies The second one is the behavior of TSOs being not unbundled from generation or from the interests of their national block of stakeholders. The European Commission acts weakly because it would require severe interferences in the Member States' institutions and policies. Only the European Competition Authority (DG COMP) and the European Court of Justice have some power to pull national governments and national entities out of their retrenchments. How it can be done, is still to be seen. So currently it is not likely that the measures described above will be implemented. As Newbery (2002) argued "*the EU lacks the necessary legislative and regulatory power to mitigate generator market power. Unless markets are made more contestable, transmission capacity expanded and adequate generation capacity ensured, liberalization may lead to higher prices*". The national governments pursue quite different objectives. In some countries it is obvious that, so far, governments support their national utilities, and are not eager to introduce effective competition. Hence, it can not be taken for granted that one integrated European electricity market will ever emerge. A second-best solution would be to foster competition in regional sub- markets by incremental reduction of barriers to cross-border trade as well as to the inclusion of generators and suppliers, thus paving the way to more confrontation between electricity and gas companies in the dual fuel markets.

- A very ambiguous role is played by privatization. On the one hand, there is currently a strong majority in Europe who see privatization as the politically correct solution regarding ownership[23]. On the other hand, privatization frequently means only the maximize of the market value of the shares sold to the buyers, being …the large incumbent players (the "seven brothers" depicted by (Thomas (2003)). This problem partially applies to EdF, the most important looming privatization case. Of course, the French government is not looking to reducing the potential value of its EDF shares (50

[23] Note, that this is not the opinion of all authors of this paper.

to 60 billions of euros). Therefore it has no economic incentive in strengthening competition at home and it prefers, instead, strengthening the position of its own champion in France as well as in the EU markets.

- Finally, it is stated that currently in most regions there are still sufficient spare capacities in generation and transmission available. The definitive litmus test for liberalization will come in every sub-market in CE at the point-of-time when the bulk of excess capacities has disappeared and demand has come close to available capacities. That is to say, the most important problem is to provide long term incentives for investments in the upgrade and in new generation and transmission capacities, as well as in demand-side efficiency and demand responsive measures. This issue is especially relevant in the context of decentralized – *vs* - further centralized development of the electricity supply system.

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APPENDIX:

Table A-1. Population, GDP, Electricity consumption and generation (by source) in CE countries in 2004 (Source: OECD (2005), UCTE 2005), national homepages)

Country	Popula-tion	GDP	Net con-sumption	Total Generation	Hydro*)	Other Renew-ables	Thermal	Nuclear	Im-ports	Ex-ports
	(Mio)	(bill. USD 2003)	(TWh)	(TWh)	(TWh)	(TWh)	(TWh)	(TWh)	(TWh)	(TWh)
AT	8.1	255.2	51.8	56.5	37.6	0.9	17.9	0	19	13.4
BE	10.4	304.2	87.5	81.4	1.6	1.2	33.7	44.9	14.6	8.3
CZ	10.2	90.4	61.4	77.9	2.5	0	50.6	24.8	9.8	25.5
FR	61.5	1758	445.1	548.2	64.5	1.5	55.4	426.8	7	73.1
DE	82.5	2402	554	570.1	26.7	25	360	158.4	45.8	53.8
HU	10.1	82.8	38.2	31.0	0.2	0.2	19.4	11.2	11.4	4.5
IT	58.1	1468.3	322	300.4	48.7	7.27	244.4	0	51.5	0.5
LU	0.5	27	6.3	4.0	0.9	0	3.1	0	6.1	2.8
NL	16.2	512.7	110.9	94.1	0.1	4	86.4	3.6	20.8	3.8
PL	38.2	209.5	144.8	154.1	3.2	1.2	149.7	0	5.3	14.6
PT	10.4	146.8	45.5	39.4	9.9	1.7	27.8	0	3.1	0.3
SK	5.38	32.7	26	28.9	3.5	0	9	16.4	1.8	4.1
SL	2.0	19.0	12.3	13.2	2.7	0	4.5	5.2	2.9	3.8
ES	40.8	840.5	234.5	257.1	33.3	15	147.9	60.9	9.5	8.2
CH	7.4	321.8	60.4	64.5	35.1	1	3	25.4	27	30.2

*) numbers on hydro include the pumped storage generation

Table A-2 Electricity generation capacity (by source) in CE countries in 2004 (Source: UCTE (2005))

Country	Hydro (MW)	Other renewables (MW)	Nuclear (MW)	Thermal (MW)	Total gross capacity (MW)	Available net capacity (MW)	Peak Load (MW)
AT	11 700	670	0	5 900	18 270	13 446	8 962
BE	1 413	248	5 801	8 206	15 668	12 700	13 708
CZ	2 128	11	3 760	10 526	16 425	11 716	10 157
FR	25 110	950	63 400	26 920	116 380	84 016	81 400
DE	9 895	16 460	20 643	79 533	126 531	79 989	77 200
HU	48	28	1 755	5 657	7 998	5 811	6 012
IT	20 499	2 747	0	55 112	78 358	48 148	53 606
LU	1 128	43	0	474	1 645	1 205	994
NL	37	1 228	449	19 251	20 965	16 408	15 601
PL	2 192	73	0	29 451	31 716	25 511	21 146
PO	4 512	572	0	6 571	11 655	8 137	8 261
SK	2 429	2	2 640	2900	8 059	5 227	4 319
SL	840	0	670	1 262	2 772	2 185	2 006
ES	18 241	6 899	7 694	31 098	63 932	40 961	37 724
CH	13 200	300	3 200	600	17 300	12 278	9 656

Table A-3 Transmission capacity and physical flows 2004 for connections/directions with more than 35% use (Source: ETSO, UCTE 2005)

	NTC [MW] 2005	Winter power flow max. [MW]	Summer power flow max. [MW]	% used Winter	% used Summer	[GWh] 2004	[GWh] max.	% used 2004
FR - DE	2300	767	2393	33.3%	104.0%	15482	20148	76.8%
DE - CH	3000	1194	1296	39.8%	43.2%	11830	26280	45.0%
AT - DE	1400	585	876	41.8%	62.6%	4465	12264	36.4%
DE - AT	1600	1295	1156	80.9%	72.3%	8922	14016	63.7%
DE – NL	3800	3664	1874	96.4%	49.3%	17357	33288	52.1%
FR – IT	2650	1758	1944	66.3%	73.4%	17125	23214	73.8%
FR – BE	2250	466	1701	20.7%	75.6%	7597	19710	38.5%
CH - IT	2800	3341	2232	119.3%	79.7%	19915	24528	81%
AT – CH	1200	642	571	53.5%	47.6%	4419	10512	42.0%
AT – IT	220	144	271	65.5%	123.2%	1621	1927.2	84.1%
PL - CZ	1650	1733	1233	105.0%	74.7%	9154	14454	63.3%
DE - PL	700	383	254	54.7%	36.3%	3158	6132	51.5%
CZ - DE	1700	1387	1731	81.6%	101.8%	13116	14892	88.1%
CZ -AT	1100	1095	728	99.5%	66.2%	6248	9636	64.8%
AT-SL	650	220	304	33.8%	46.8%	2002	5694	35.2%
CZ -SK	1720	795	480	46.2%	28.0%	6045	15067.2	40.1%
SK - HU	1100	1161	1010	105.5%	91.8%	8546	9636	88.7%
SL - IT	380	889	640	233.9%	168.4%	6180	3328.8	185.7%
FR-ES	1400	1246	849	89.0%	60.6%	6034	12264	49.2%
ES-PO	700	1263	1114	180.4%	159.1%	8523	6132	139.0%

Table A-4. Countries' acronyms

Acronym Country	Country
AT	Austria
BE	Belgium
CZ	Czech Republic
FR	France
DE	Germany
HU	Hungary
IT	Italy
LU	Luxemburg
NL	The Netherlands
PL	Poland
PO	Portugal
SK	Slovakia
SL	Slovenia
ES	Spain
CH	Switzerland