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The Liberalisation of the Continental European Electricity Market – Lessons Learned

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ABSTRACT

The liberalisation of the electricity market in Continental Europe started in the late 1990's and is still ongoing. In this paper, past developments in this market are analysed and conditions necessary to enhance competition in this market in the long run are derived.

Our major conclusion is that at a minimum, the following conditions would be necessary to bring about effective competition in the long run: (i) complete ownership separation of the transmission grid from generation and supply in all countries and sub-markets; (ii) adequate capacity margin in generation; and (iii) a sufficiently large number of generators sharing this capacity. As it is not likely that these conditions will be fulfilled, the prospects for a vibrant competition in Continental Europe are doubtful.

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INTRODUCTION

The liberalisation of the electricity market in Continental Europe started in the late 1990's and is still ongoing. With the exception of Spain, which initiated an electricity pool in 1997, this process was triggered by the "Directive for a common electricity market" issued by the European Commission (EC) in 1996. The major motivation for this directive was the EC's belief that liberalization, price deregulation and privatization will directly lead to competition in generation as well as supply, resulting in lower prices throughout Europe.

The intention of the EC was and still is the creation of one common European electricity market. Currently, this area consists of at least seven distinct sub-markets separated by partly insufficient transmission capacity and differences in access conditions to the grid (Fig. 1.).

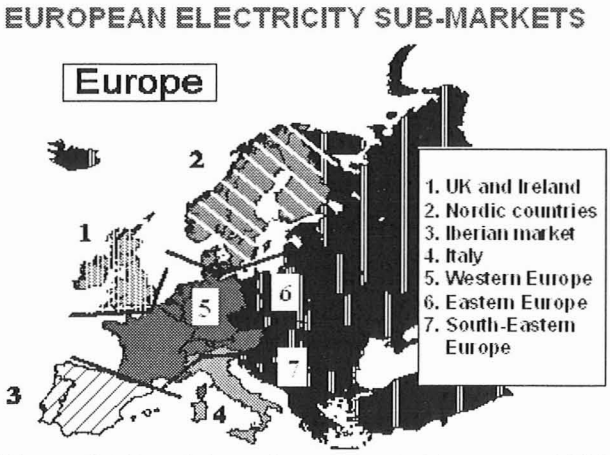

Figure 1. Electricity sub-markets in Europe in 2005

The objective of this paper is to analyze the evolution of the Continental European electricity markets and discuss future developments with respect to competition (See former treatments in Glachant & Finon (2003), Jamasb & Pollitt (2005), as well as the special issue of the *Energy Journal* (2005)). The paper covers most of what is currently called "Continental Europe" (CE)[1]. It is organized as follows: Section 2 provides some background information with major data on electricity supply and demand in the CE markets. Section 3 describes EC and national governments' market liberalization initiatives and

[1] Austria, Belgium, Czech Republic, France, Germany, Hungary, Italy, Luxemburg, The Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, and Switzerland. For a list of the country acronyms see Table A-2 in the appendix.

the major changes country by country. Section 4 discusses the evolution of the markets corresponding to the governments' initiatives and the market's remaining problems, followed by conclusions in Section 5.

BACKGROUND

Before 1990, almost every electricity supply industry in Continental Europe was vertically integrated with a captive franchise market, either state-owned (the majority case) or under price-regulated mixed private/public ownership (in Belgium, Germany and Switzerland). Regulated area monopolies prevailed in all countries.

Yet, ownership structures and the degree of vertical integration were quite different among the 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 (retail).
- In Austria there was one large generator integrated with transmission and about 14 regional suppliers fully integrated with distribution.
- In the Netherlands there was an upward vertical integration by the distribution companies controlling the grid and the generators;
- In Belgium, most of the power sector has been private for decades. The private generator Electrabel is supervised and controlled by a mother company Tractebel linked to the gas monopoly Distrigas;
- Belgium, Germany, Spain, and Switzerland were the only countries in the mid-1990's 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). This contrasted with the state-owned enterprises in France, Italy, Portugal, and the remaining Central and Eastern countries.

DEVELOPMENT OF DEMAND AND SUPPLY

Total demand was approximately 2300 TWh in the CE area in 2004. Currently, the largest electricity markets are in Germany, France, Italy, and Spain. The highest per capita demand is in Luxemburg, Belgium and

Switzerland. The lowest per capita demand is in Poland, Hungary, Portugal, and Slovakia. Demand growth per year is strongest in Spain (+5.0%), Portugal (+4.9%), and Austria (+3.1%). In Poland and Germany demand increased only by about 1%. In all CE, electricity consumption grew from 1% to 3% per year between 1999 and 2004. Details are depicted in Fig. 2.

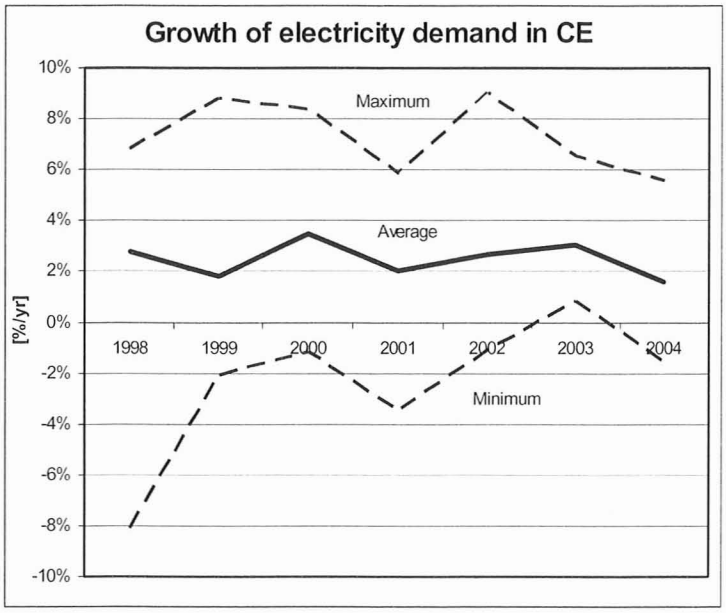

Figure 2. Growth of electricity demand in CE countries 1998-2004

GENERATION CAPACITY AND LOAD

Capacity margin is different among countries as can be seen from Fig. 13. 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 3 depicts the evolution of gross generation capacity over the last 10 years in CE. The growth in capacity is mainly from wind power and fossil power plants.

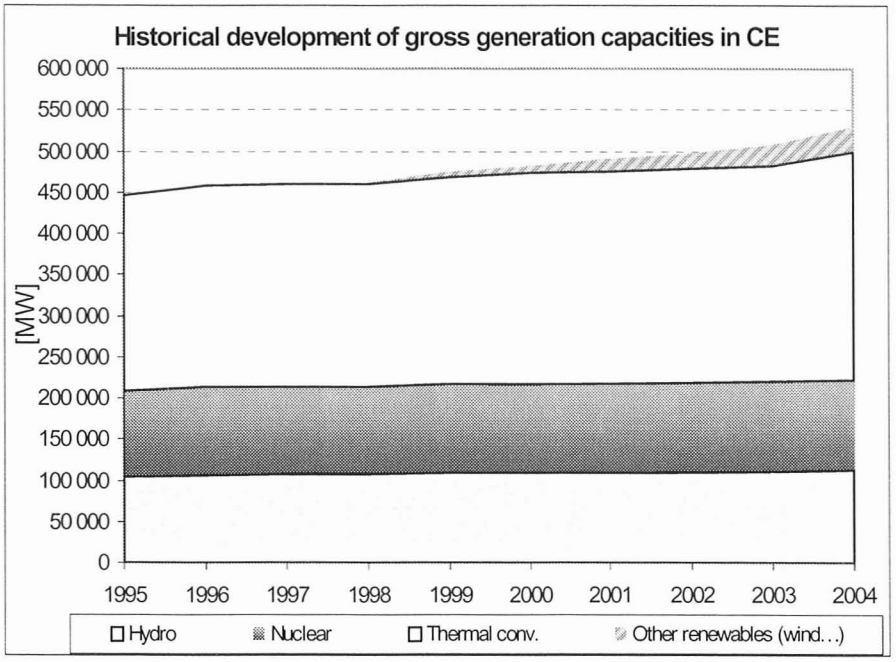

Figure 3. Evolution of generation capacity in CE 1995-2004
(Source: UCTE, national reports)

IMPORTS AND EXPORTS

In 2004, the total amount of electricity exchanged between CE countries stood at about 300 TWh. This is equal to about 13 % of consumption and is frequently limited by the constrained cross-border transmission capacity. Figure 4 and Fig. 5 show the physical[2] electricity exchange 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.

[2] Some of these flows are not due to contracts between countries but result from loop flows (e.g. from Germany to Poland to Czech Republic back to Germany)

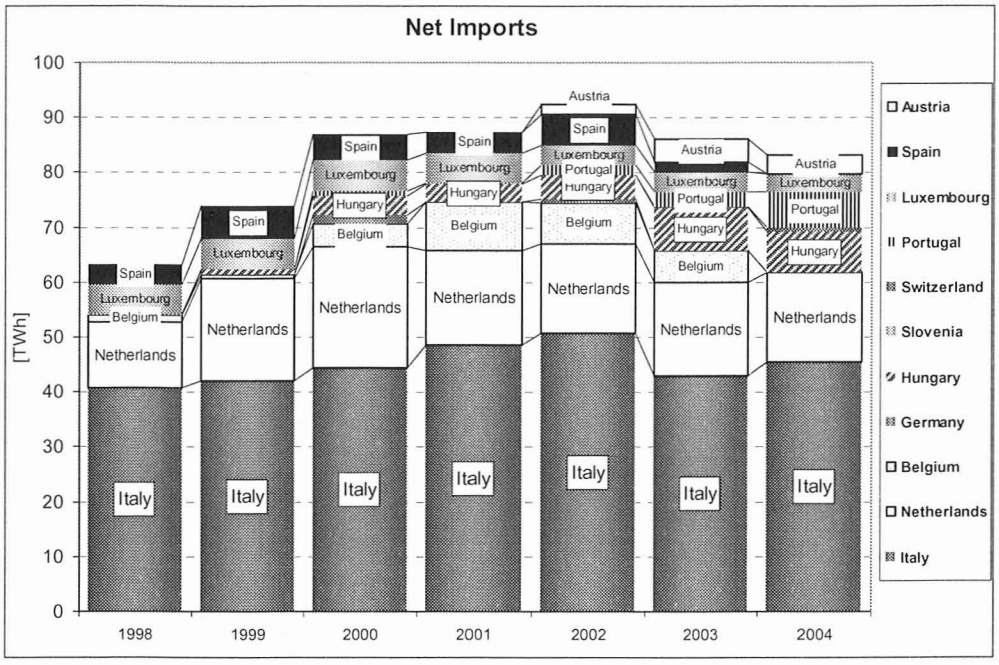

Figure 4. Evolution of net imports in CE over the period 1998-2004
(Source: UCTE (2005)

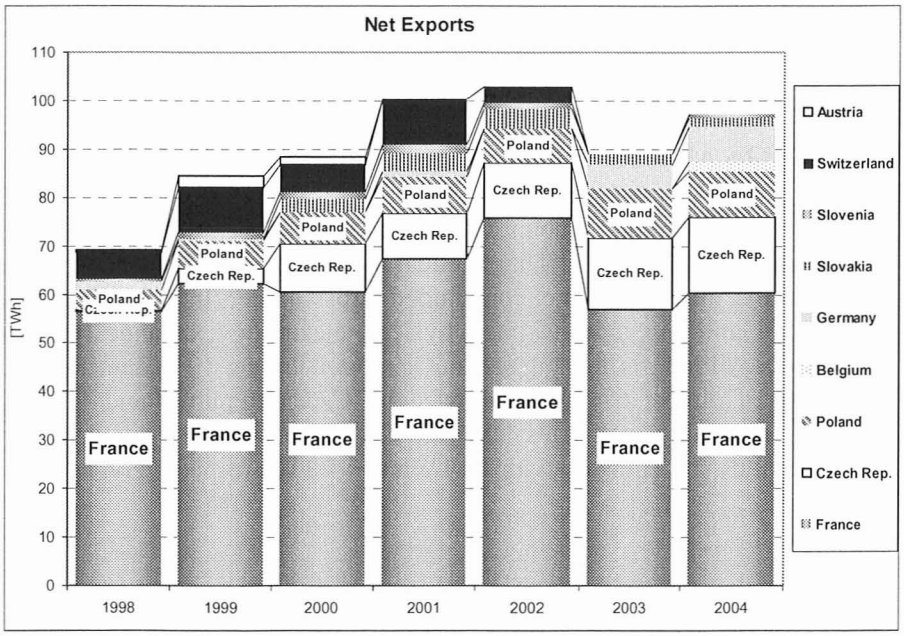

Figure 5. Evolution of net imports in CE over the period 1998-2004
(Source: UCTE (2005)

PAST AND CURRENT ISSUES OF TRANSMISSION

The bulk of the transmission and distribution networks in Europe have been built prior to the introduction of market liberalization, between 1950 and 1990, with few additions in recent years.

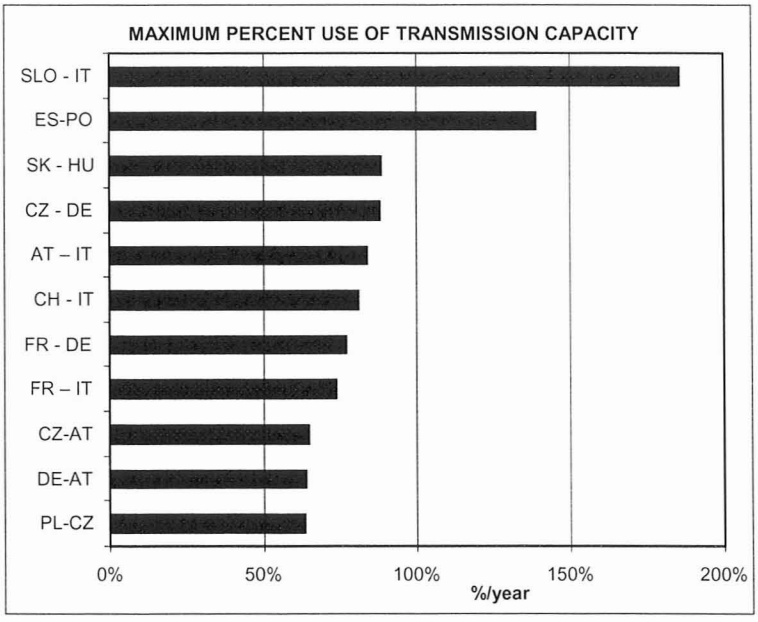

Figure 6. Major bottlenecks in CE transmission grids measured as a percentage of use of transmission capacity per year in 2004
(Source: UCTE (2005).

Figure 6 presents the highest percentages of Net Transfer Capacity (NTC) used in 2004 between CE countries. Due to the operating complexity of a 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[3] and its neighbouring countries,

[3] The values substantially exceeding 100 % in Figure 6 require further explanation: the transmission capacity is the NTC defined by the UCTE. However the actual thermal capacity (the real physical capacity) of the line is higher. Yet, it depends on the characteristics of the material and the ambient temperature (i.e. season). For instance it is higher in winter and lower in summer. This leads to possible numbers higher than 100% as exhibited in Fig. 6.

and between Spain and Portugal. But next are already the borders between Germany, Austria and the Czech Republic.

In principle, the congested lines need a special mechanism to be managed in an economic way (see Section 4). 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 to be used more in an economic way, under optimisation processes of scarce capacity, and to produce price convergence in a single European market perspective.

POLITICAL ISSUES OF RESTRUCTURING

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

- Minimal requirements for *unbundling* of generation and transmission;
- Minimal *market opening*, expressed by the consumption size of the "eligible customers";
- Different approaches for *access to the grid* (negotiated or regulated, third party access (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 of reforming the electricity sector in CE is provided in Table 1.

In practice, the major area of action within the European liberalization project was "providing access to the market". Far less attention was paid to the issues of restructuring generation & supply and designing marketplaces as well as ensuring adequate generation and transmission capacity. Independent energy regulators were introduced in all countries except Germany and Switzerland. Environmental issues were also treated very prominently.

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

Table 1. Restructuring milestones 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

Table 2. Types of unbundling of Transmission System Operators (TSO) and access to the grid in CE (as of 31st December 2004*)

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: 100% 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

(Source: CEC (2004), company reports, Power in Europe and the author's investigations)

*) rTPA...regulated third party access, nTPA...negotiated third party access, SB...Single Buyer model). Source: CEC 2005

+) Legal… legal separation of transmission and generation

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 are diverse. 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 flotation of a transmission subsidiary. In other countries, especially in Germany and France, only legal unbundling took place. In Switzerland, so far unbundling was only done by means of internal management measures. No structural guarantee exist for avoiding discrimination in access to the grid, particularly as no independent regulator can monitor the behavior of the grid managers.

Table 2 provides the current status of unbundling. The second issue is the regime of access to the grid. Table 2 shows access to the transmission grid in various Western European countries (CEC (2005)). Access to the grid was regulated in all countries except Germany where it was introduced in June 2005.

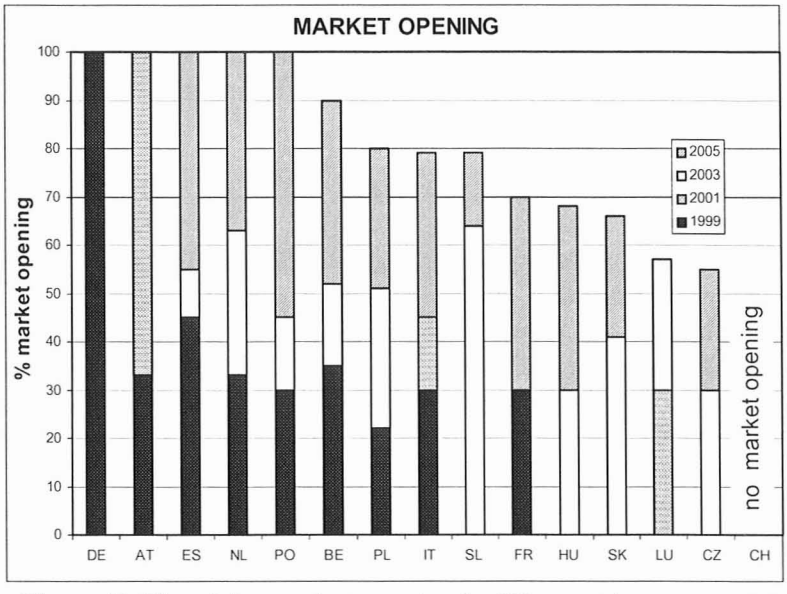

Figure 7. Electricity market opening in CE countries. *Source: EC.*

The third issue is market opening. The different market openings, in location and in time, have led to some distortions regarding free choice of supplier. Fig. 7 depicts the opening of the market in different EU member countries from 1999 to 2005. Some countries like Germany, The Netherlands, Spain, Portugal and Austria have legally fully opened their market while others like France, Luxemburg, and Czech Republic have only partially opened their markets. In Switzerland (which is not member of the EU) there is currently no competition in supply.

THE NEW INSTITUTIONAL AND REGULATORY ENVIRONMENT

In all countries, except Germany and Switzerland, independent regulatory authorities have been created. Their powers vary widely from one country to another but their 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 at the national level and an incomplete process of convergence across countries. Countries[4] established nationally-based regulatory authorities administered by nationals. They regulate access to the national TSO's grid and operating system. All this is done within the laws of the country and with recourse to its courts, while the European Directives and Regulations provide only a broad common frame. However the European Commission or the European Court of Justice can intervene on a case by case basis.

THE PROMOTION OF RENEWABLES

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) reducing greenhouse gas emissions. To meet this target the EU has defined ambitious objectives which were 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). As a result of 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).

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[4] Except Germany and Switzerland.

COMPARISON OF DEVELOPMENTS BY COUNTRY

The developments towards competition in the countries and sub-markets so far were quite different as can be seen from Table 3.

Table 3. Differences in reforming and market design in various CE Countries

	Process of market opening	**Central-ized pool**	**Voluntary Day Ahead Exchange**	**Futures market**	**Privati-ation process**	**Divestment of generation capacity**	**Takeover, Merger within the country**
AT	Fast	No	YES (EXAA)	No	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
H U	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	No	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	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	No	*)	No	No

Major differences between the countries refer to:

* Market opening (see also Fig. 7): differs between 1999 (Germany) and probably 2007;
* Introduction of centralised pools (only in Spain), spot markets (Germany, Austria, The Netherlands, Poland, Slovenia, Italy, Czech Republic), futures market (only in Germany);
* Privatisation (most aggressively pursued in Italy, The Netherlands and Slovakia);
* Divestment of capacities (Conducted only in Italy and Poland)

Mergers and takeovers: mainly in Germany and cross-border takeovers and share purchases (of EdF, E-ON, ENEL, ELECTRABEL, RWE).

THE PERFORMANCE OF THE MARKETS

Today, the EC has successfully initiated an ambitious project for building a new electricity market. But there are no guarantees that the dynamics of this construction will not dissipate, as in the United States, 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 on the strategic behavior of electricity generators and network operators. Similarly we note the caveats expressed by Banks (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 experiences in the UK and the Nordic market (Norway, Sweden...).

Currently, the major obstacle for European common market(s) 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. These aspects are reinforced by (at least) two others: 1° insufficient transmission capacity available between the submarkets, and 2° 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 supply adequacy.

ACCESS TO THE MARKET

There are three major priorities for improving access to the CE grid:

i) regulate the TPA. Pfaffenberger et al (2004) emphasize this issue, especially for Germany which has so far not regulated access to the transmission grid;
ii) obtain non-discriminatory, open, and competitive balancing arrangements. Balancing arrangements must not handicap the arrival of new entrants or existing operators that are not vertically integrated, and they should be open to all potential competitive sources of supply (Glachant & Lévêque 2005).
iii) harmonize national transmission access pricing schemes and cross border pricing. This would contribute to lower transaction costs in international competition.

MERGERS, TAKEOVERS AND MARKET CONCENTRATION

For effective competition, a large number of companies are needed. No other model has so far been successful. This was proven clearly by the example of England & Wales where the number of generators was increased several times by the regulatory authority (as well as by investors, notably the regional distribution & supply companies, the RECs). The "merger-mania" in CE after the start of liberalization indicates that the major strategy of the bigger incumbent utilities is to compete by merging to purchase market shares.

In many Eastern European countries, national companies have been sold to strategic investors from abroad, with EdF, E.On, RWE, Electrabel and Vattenfall all being particularly active. In reaction, some countries, like Czech Republic, Slovakia & Slovenia have chosen to retain national champions. These national champions have the size to stay alive alongside the larger European groups with unfortunate consequences for the level of competition within their respective national markets and for the global European competitive game. The vested interests of the dominant incumbents in the region would encourage them to fight against greater competition pushed by further reforms.

With respect to market shares in CE, in 1998 ten generators owned 60% of the generation capacity while in 2002 this share was concentrated in six generators (see Codognet et al (2005)). Thomas (2003) suspects that in the end only "seven brothers" will remain as large generators within Europe. Of particular concern with respect to competition is the situation in Central Europe (France, Germany, BeNeLux, 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 an aggressive acquisition policy is pursued abroad. Verbruggen et al (1999) show the same for the Electrabel – Distrigas group in Belgium.

As can be seen from Fig. 8, from 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 that in the ranking of the largest generators public ownership prevails.

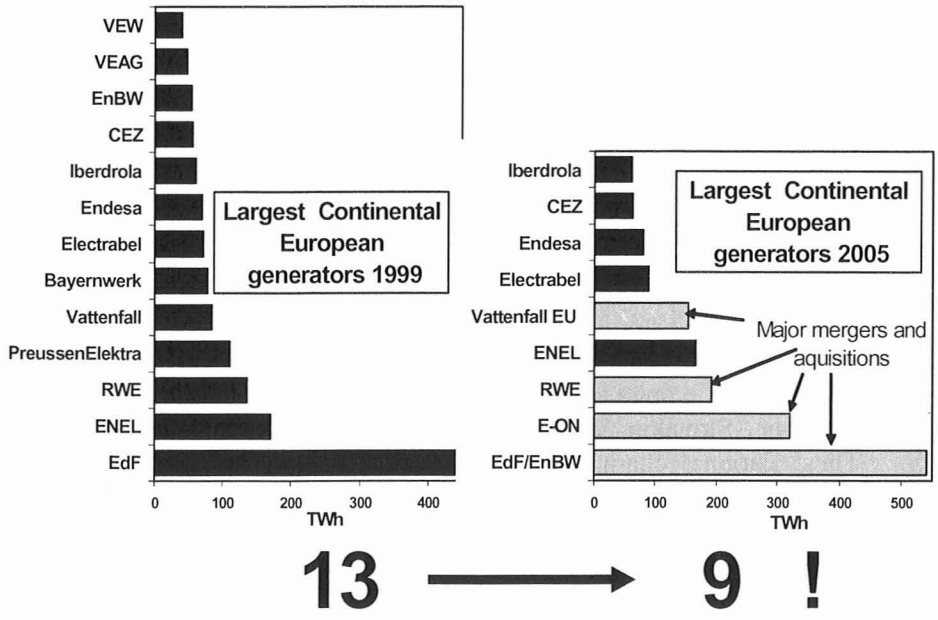

Figure 8: Largest Continental European Electricity Generators in 1999 & 2005. *(Source: authors' own investigations)*

Table 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 and the import potential is limited.

Table 4. Market shares of largest generators in various countries 2004
(Source: company reports, Power in Europe, personal information)

	Largest (%)	Three 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)

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. Yet, with some minor exceptions (Spain, Italy) currently there are no signs in any country pointing in this direction.

Another issue is that privatization is often seen as more important than carefully designing the 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. For years the privatization of EdF has been under discussion and a public share offering was held 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).

WHOLESALE ELECTRICITY PRICE EVOLUTION

Of greater interest is how electricity prices developed after restructuring. Figure 9 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 moderated during 2004. In the first half of 2005, prices in Western markets increased, while prices in Poland remained on the level of 2004.

From Fig. 9 we derived the following effects:

(i) In Western Europe prices increased relative to the start of liberalization;
(ii) the price level is highest in areas where capacity margin is smaller and cross-border transmission capacity congested (Italy, The Netherlands);
(iii) prices have been highest in years with low hydro or low nuclear availability;
(iv) however wholesale prices go up and are converging to the top in markets connected by sufficient transmission capacity.

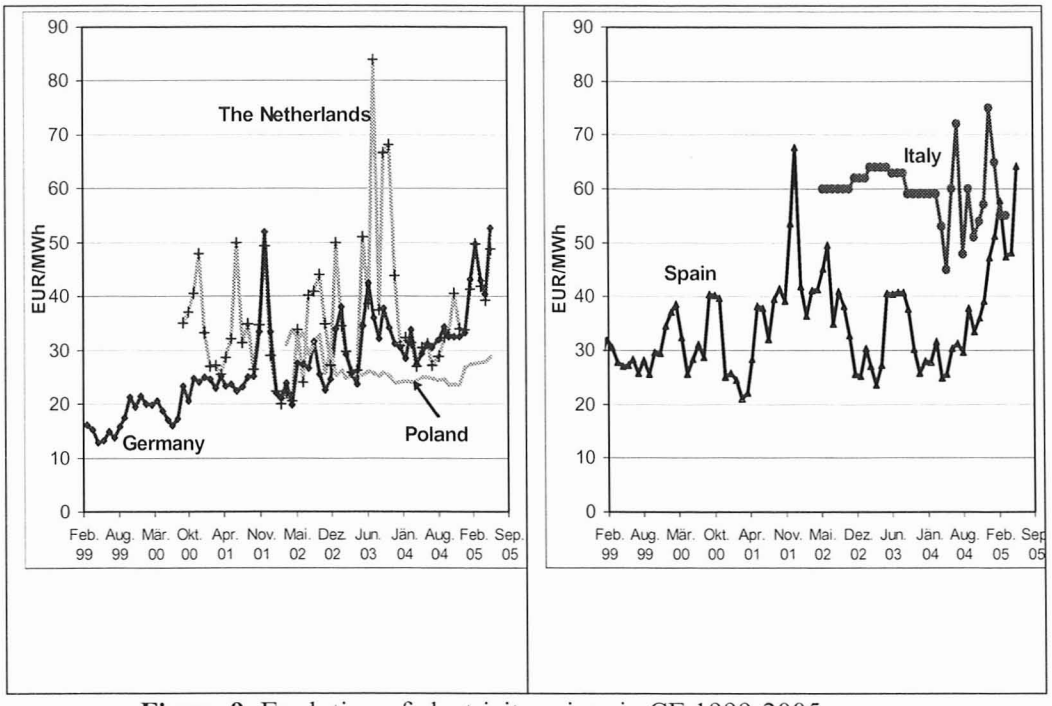

Figure 9. Evolution of electricity prices in CE 1999-2005
(Source: Homepages of the power exchanges)

Therefore a major question for further investigations is, whether these prices are a competitive outcome. That is to say, whether these prices do reflect the marginal costs of the generation set or whether they are increased by some kind of market power.

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 10 and 11 depict the price evolution in CE from 1995 to 2004 for households and large industrial customers. As can be seen from Fig. 11, large electricity users were seeing – at least temporarily – lower prices. Yet as Fig. 10 shows, households electricity prices in 2004 were already at the same level as before liberalization started or even higher. With the exception of Poland since 2003 (and for most countries even earlier), prices started to increase. Moreover, neither for households nor for industrial customers was there convergence in prices, which was one of the expectations for a common European market.

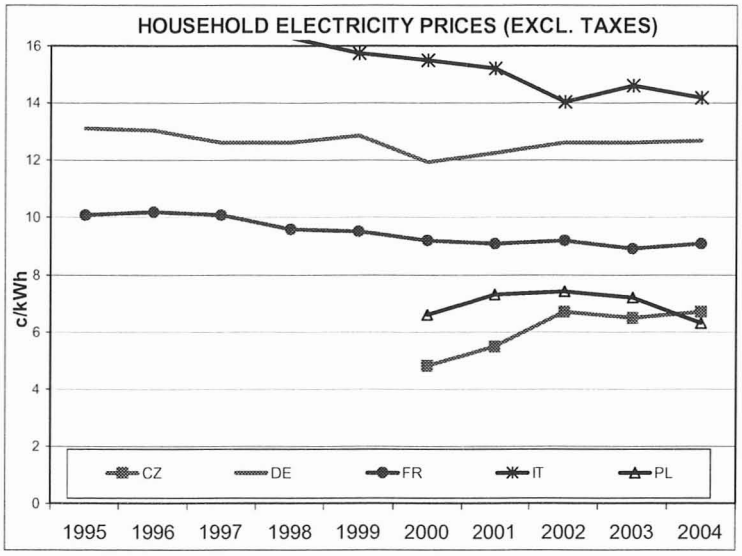

Figure 10. Evolution of households' electricity prices in some CE excl. taxes
((Source: CEC (2004), CEC (2005), based on EUROSTAT Dc, average electricity consumption: 3500 kWh).)*
*)Note that the situation for Italy is specific. Average consumption is lower than 3500 kWh/yr and electricity prices for lower consumption are significantly lower (about 40%).

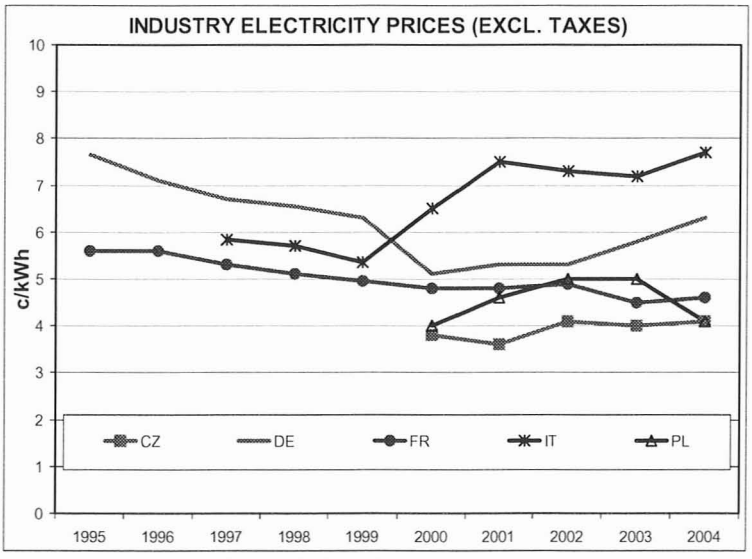

Figure 11. Evolution of large industrial customers' electricity prices in some CE countries excl. taxes
(Source: CEC (2004), CEC (2005), based on EUROSTAT Ig, average electricity consumption: 24 GWh).

Fig. 12 shows the typical pattern of price development after liberalization. After liberalization is announced prices drop. But soon after the market has settled suppliers start to increase prices again.

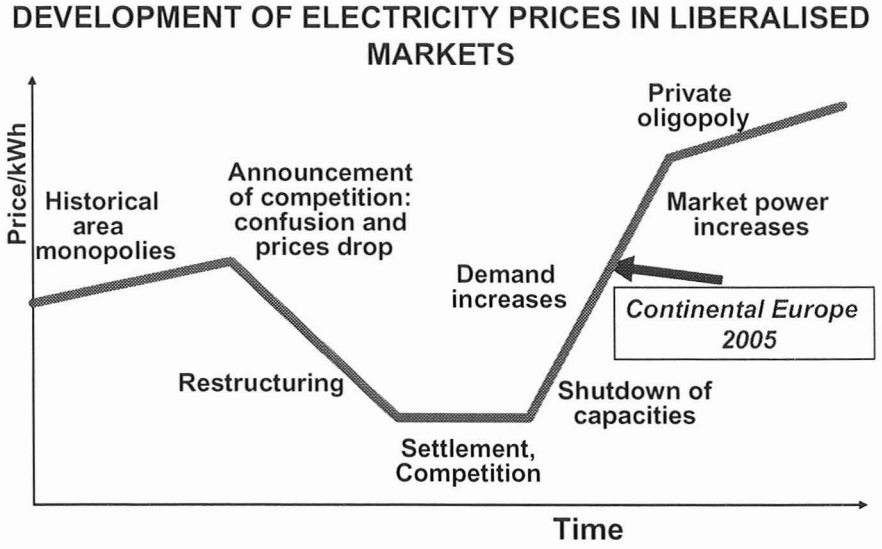

Figure 12. Typical price development in a liberalised market with non-regulated final customer prices
(Source: Haas et al (2000), Haas/Auer (2001))

PERSPECTIVES FOR ADEQUACY, RELIABILITY AND SECURITY OF SUPPLY: GENERATION AND TRANSMISSION CAPACITY

As in many electricity markets that have been liberalized, most CE countries started liberalization with significant excess generation capacity – build up in the time of regulated area monopolies. This was a common motivation and driver for introducing competition. Yet, excess capacity in generation plays a core role in the restructuring process of an ESI. With excess capacity in generation – which also depends on transmission capacity - if utilities compete the price they receive for electricity will be equal to their short term marginal cost. Under perfect competition without remarkable excess capacities, the price will be equal to the long-run marginal costs (LRMC). But if there is no competition, or capacity is too tight, the price can be substantially higher than both marginal costs especially when demand is inelastic to price.

Fig. 13 depicts the currently looming developments of load and generation capacity[5]. In recent years spare capacity decreased continuously in CE sub-markets (spare capacity = net capacity minus maximum load). This picture is not the same in various countries. In Italy, load has already surpassed available net capacity. In Spain & Portugal, the danger of shortages had already existed ((Crampes & Fabra (2005): "*With no plant entering into operation from 1998 to 2002 and a steep increase in demand ... the system has operated below acceptable adequacy indeed since 2000*"). In Western Europe (FR, DE, CH. AT), the current trend implies generation capacity needs by 2008 or 2009.

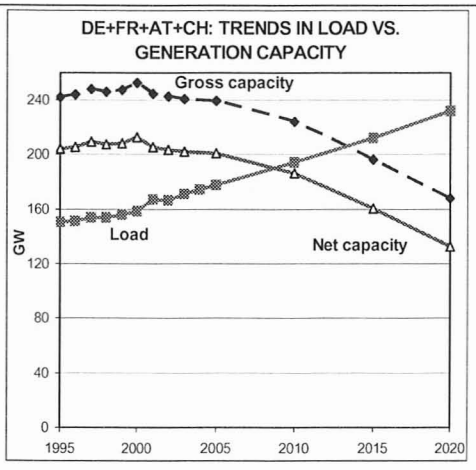

Figure 13a: Current and future trend of generation capacity (excl. wind) & load in Germany, Austria, France and Switzerland

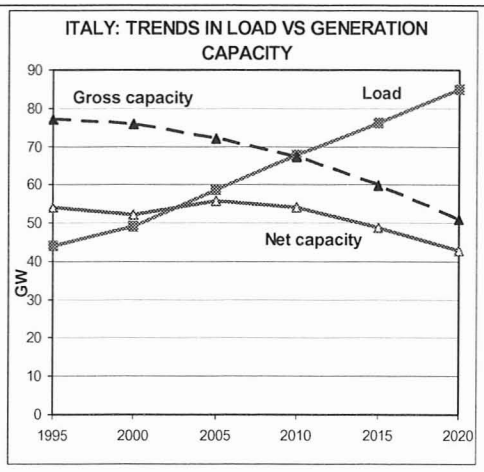

Figure 13b: Current and future trend of generation capacity (excl. wind) & load in Italy

[5] 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

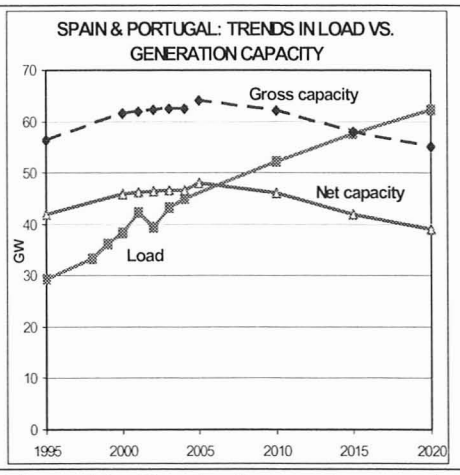

Figure 13c: Trends of generation capacity (excl. wind) & load on the Iberian peninsula

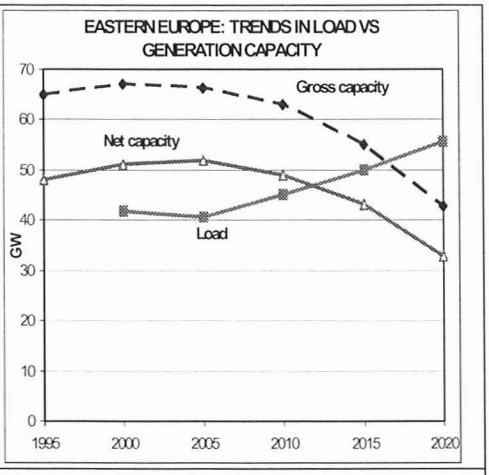

Figure 13d: Trends of generation capacity (excl. wind) & load in Eastern Europe

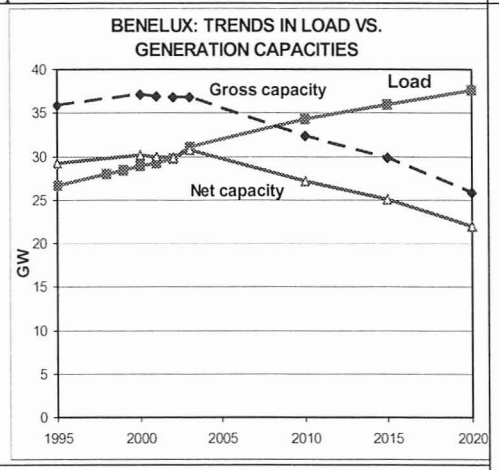

Figure 13e: Trends of generation capacity (excl. wind) & load in BENELUX countries

Eastern Europe (CZ, HU, PL, SK, SL) has adequate generation capacity for the foreseeable future, and will continue to be heavily weighted towards coal and nuclear power (see Auer et al 2005). One remaining major uncertainty in Eastern countries is the magnitude of demand growth.

Currently, transmission constraints have a substantial impact on the separation of sub-markets in Continental Europe. Hence, another important prerequisite for a sufficiently wide market would be that there is sufficient

transmission capacity to neighbor regions, increasing the number of potentially competing generators.

CONCLUSIONS

While the liberalized CE electricity market is still under construction, major conclusions regarding the developments so far can already be drawn. Firstly, Liberalisation in CE started about a decade after the forerunners in the UK and Norway. However, it seems that the CE countries did not learn much from the UK and Norwegian experiences 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. Second, the CE electricity market is the largest regional market in Europe and its geographical position implies that further progress toward an integrated electricity market in Europe will depend strongly on the development of this market (Jamasb&Pollitt (2005)). France and Germany play a key role within this market because of their size and central geographic position. Thirdly, currently the major obstacle for a common market that works reasonably 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 are too high or incentives to collude are too high. This aspect is reinforced by (at least) two others: an insufficient transmission capacity available between the submarkets and an increasing horizontal integration with natural gas supply. Fourthly, the EC itself is in an ambiguous position. On the one hand, it still advocates the goal of a European-wide common electricity market to be reached by 2012. On the other hand, only very weak light-handed measures are being implemented at the European scale. One of the major problems still is and will be that the market power of the large – and still growing – incumbent generators cannot be tackled by the EC. The second one is the behavior of TSOs that are not unbundled from generation or from the interests of their national block of stakeholders. The EC acts weakly because stronger action would require dramatic changes to Member States' institutions and policy. 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*". Only the European Competition Authority and the European Court of Justice have some power to push national governments and national entities further.

Exactly how this might be done remains an open question.

In addition, a very ambiguous role is currently being played by privatization. On the one hand, there is currently a strong majority in Europe which sees privatization as the politically correct solution regarding ownership. On the other hand, privatization frequently simply means a maximization of the market value of the shares sold to one of 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 towards reducing the potential value of its EDF shares (50 to 60 billions of euros). Therefore, it has no economic incentive to strengthen competition at home and it should prefer strengthening the position of its champion in France as well as in the EU markets.

Finally, it is stated that currently in most regions there is still sufficient spare capacity 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 capacity has disappeared and demand comes close to available capacity. 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 responsiveness measures. This issue is especially relevant in the context of further development of the electricity supply system and the decentralized *vs* centralized choices.

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APPENDIX:

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

Country	Population	Net consumption	Total Generation	Hydro*)	Other Renewables	Thermal	Nuclear	Total gross capacity	Available net capacity	Peak Load
	(Mio)	(TWh)	(TWh)	(TWh)	(TWh)	(TWh)	(TWh)	(MW)	(MW)	(MW)
AT	8.1	51.8	56.5	37.6	0.9	17.9	0	18 270	13 446	8 962
BE	10.4	87.5	81.4	1.6	1.2	33.7	44.9	15 668	12 700	13 708
CZ	10.2	61.4	77.9	2.5	0	50.6	24.8	16 425	11 716	10 157
FR	61.5	445.1	548.2	64.5	1.5	55.4	426.8	116 380	84 016	81 400
DE	82.5	554	570.1	26.7	25	360	158.4	126 531	79 989	77 200
HU	10.1	38.2	31.0	0.2	0.2	19.4	11.2	7 998	5 811	6 012
IT	58.1	322	300.4	48.7	7.27	244.4	0	78 358	48 148	53 606
LU	0.5	6.3	4.0	0.9	0	3.1	0	1 645	1 205	994
NL	16.2	106.1	94.1	0.1	4	86.4	3.6	20 965	16 408	15 601
PL	38.2	144.8	154.1	3.2	1.2	149.7	0	31 716	25 511	21 146
PT	10.4	45.5	39.4	9.9	1.7	27.8	0	11 655	8 137	8 261
SK	5.38	26	28.9	3.5	0	9	16.4	8 059	5 227	4 319
SL	2.0	12.3	13.2	2.7	0	4.5	5.2	2 772	2 185	2 006
ES	40.8	234.5	257.1	33.3	15	147.9	60.9	63 932	40 961	37 724
CH	7.4	60.4	64.5	35.1	1	3	25.4	17 300	12 278	9 656

*) numbers on hydro include the pumped storage generation

COUNTRIES' ACRONYMS

Acronym	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