

How to Ensure Effective Competition in Western European Electricity Markets

By Reinhard Haas and Hans Auer*

Introduction

Due to the electricity guideline of the European Commission in Western Europe, competition has started and prices dropped substantially, especially for large industrial customers. Hence, in Europe restructuring of the ESI is (currently still) widely accepted and considered to be successful so far. The major reason for this is the expectation that decreases in prices will continue and low prices will prevail over the next years.

Yet, surprisingly, up to now only few investigations exist on the conditions necessary for long-term competition in electricity markets. As has been argued by the authors – e.g., Haas et al (1997) and Haas/Auer (2000) – the expectation of lasting cheap electricity is based on very simplified assumptions on the strategic behaviour of electricity generators.

In this paper it is argued that many issues are currently neglected which may lead to tremendous backlashes for competition in Western Europe especially with respect to the level of electricity prices. The following questions are analysed:

- What are the basic principles for introducing competition and how are they currently achieved in Western Europe?
- How have the structures of the European electricity supply industry (ESI) changed in recent years and how have prices developed?
- What are the future perspectives for the ESI in Western Europe?

Due to the EU directive the liberalisation targets are:

19 February 1999	Users taking >40 GWh/yr, or 25% of national market
19 February 2001	Users taking >20 GWh/yr, or 28% of national market
19 February 2003	Users taking >9 GWh/yr, or 33% of national market
2007	Review of liberalisation process

Moreover, the EC announced recently that it intends to fully open the electricity market in 2005. Yet, this is subject to approval by the member country governments.

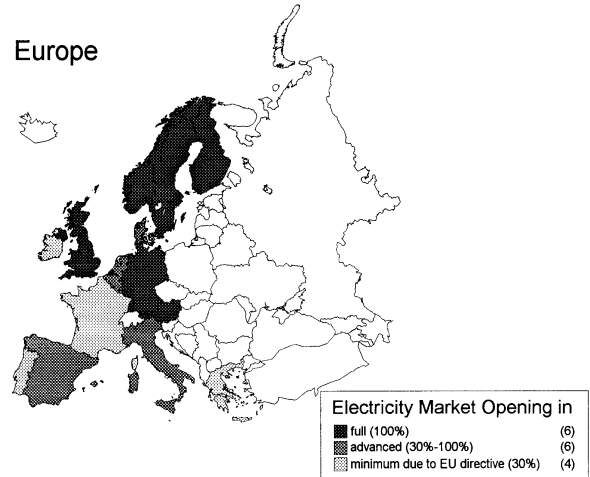
Figure 1 depicts the opening of the market in different EU member countries in 2001. Some countries like UK, Sweden, Germany and Austria will then have fully opened their market (=100%). Others like France, Greece, Ireland will only have opened the minimum. Norway (not in the EU) has already fully opened its market whereas in Switzerland (not in the EU) there still exist captured customers.

Basic Principles for Introducing Competition

The European debate on restructuring of the ESI is sometimes confusing. Especially the terms “deregulation”, “liberalisation”, and “competition” are very often mixed up. Another major contradiction and misleading perception is that deregulation means “privatisation”.

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Figure 1
Market Opening in EU Countries (incl. Norway) in 2001



In the following the most important basic principles for introducing competition are summarised. It is important to note also that the following order in which the different elements have to be introduced is important!

- **Unbundling:** Competition requires the separation of parts of the ESI where competition is possible and parts where it is not. Currently, generation and supply competition is pursued while the transmission and distribution grids remain natural monopolies. The separation of electricity generators and the transmission grid is important because of two reasons:
 - to ensure that potential new generators are not discriminated from access to the transmission grid, and
 - to avoid cross-subsidization of generation by transmission.
- **Competition:** The basic principle of competition is that so many companies are competing that it is not possible for a single company to influence the market price and to exert market power. Hence, for real competition a large number of generators and suppliers is necessary to bring electricity prices down to marginal costs of generation. Moreover, excess capacities are required to make competition possible.
- **Liberalisation:** Liberalisation from the customers' point-of-view means that they may freely choose the supplier or the generator. Moreover, in a liberalised market the supplier may choose a generator or purchase electricity at a power exchange or spot market. Of course, from the customers' point-of-view it is very important that there is a large number of suppliers and generators.
- **Perfect markets structures:** In a functioning electricity market an equilibrium between different types of periodical markets exists – that is to say, between long-term contracts, short-term markets and balance markets. Of core relevance is that it is possible to sign long term contracts, e.g., bilateral or by futures. This possibility is a core difference between different liberalisation models. It did not exist in the “old” English pool model nor in the Californian electricity market. Yet, it does exist in the very well functioning NordPool.

If one of these market elements is completely neglected or even forbidden – as it was virtually in the case in California

with the long-term element – severe price volatilities and increases will be the result.

- **Deregulation:** The final step in the process is to abandon the regulation of electricity prices and investment recovery. Of course, this step only makes sense if real competition is guaranteed. Otherwise price deregulation may lead to a skyrocketing of electricity prices!
- **Privatisation:** Eventually the question remains whether privatisation contributes to more intensified competition. The answer to this question is “No” if the liberalised electricity markets in England and Norway are compared. In England privatisation was an important feature of the restructuring process.

In Norway traditionally a large number of vertically integrated electric utilities existed. They were mainly publicly owned. The restructuring in Norway was based on the introduction of a voluntary pool, see Banks (1996). In Norway no privatisation took place. The situation in Norway with respect to the number of generators virtually did not change over the past 20 years. The public shares in these utilities has always been higher than 50% and it is not allowed to sell majority shares to investors from abroad. Yet, competition in the English pool did not really work for most of the time. The reason was that, although, there were several generators, only a small number owned price-setting “marginal plants”. Green/Newbery (1992) found clear evidence of gaming in the UK power pool. The two largest generators made strategic use of their price bids for individual generating sets to obtain prices substantially above “real” marginal cost.

The major conclusion of this comparison is: Privatisation does not mean “increased competition” but rather “strive for monopolies respectively oligopolies”. Hence, full privatisation (100% private ownership) is not a condition for competition, which is proven impressingly by the Norwegian example.

The Western European Electricity Market

Currently, Western Europe is still far away from a joint electricity market. The Western European electricity market (15 EU member countries plus Norway and Switzerland) consists in practice of four to five markets which are rather separated. These are:

- 1) UK and Ireland, 2) The Nordic countries, 3) Spain and Portugal, 4) Italy, and 5) Central Europe (France, Germany ...).

These five markets are depicted in Figure 2. These markets are separated by geographical transmission capacity constraints and legal issues, mainly limited access to the grid (especially in France and Germany). With respect to Italy it has to be stated that the connection to other countries (mainly France and Switzerland) is mainly due to long-term contracts.

Figure 3 shows the physical exchange of electricity between these five markets in Europe in 2000.

The Development of the Number of Generators

As the current “merger-mania” shows – see Table 1 – the major strategy of investor-owned electricity generators in Europe is not to compete but rather to merge or to purchase shares. The mergers pursue two major objectives:

Figure 2
The Five Electricity Markets in the EU Countries

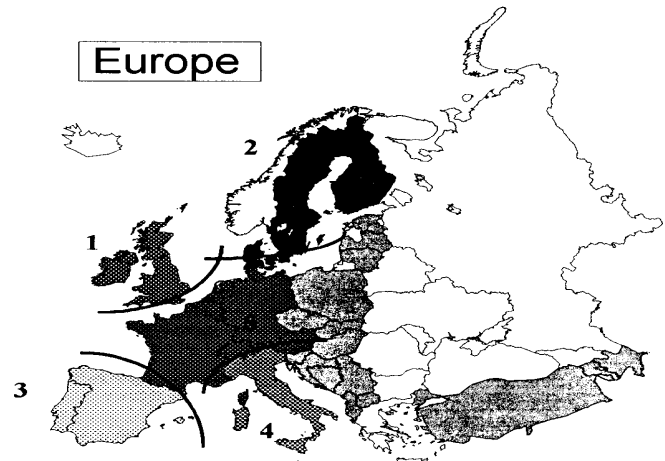
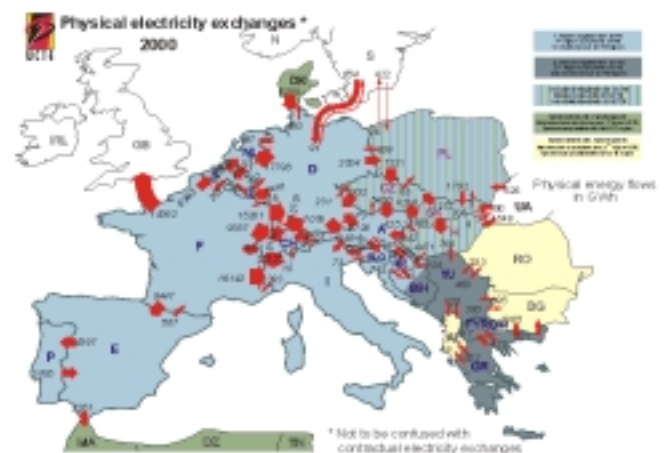


Figure 3
Physical exchange of electricity in Europe in 2000



- 1 An official one: to achieve a potential for savings due to synergies;
- 2 An unofficial one: to become able to set prices as high as possible. In practice minimal shares of owned by otherwise competing utilities respectively joint-ventures can avoid competition and to set strategic prices;

This leads to the following pattern which can be observed in most countries where liberalisation takes place: First, prices decrease but after a short period of time they start to increase considerably, see Figure 4.

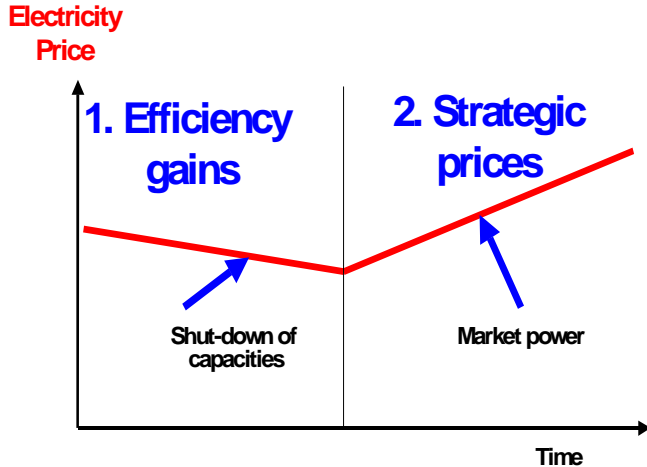
Figure 5 clearly shows that the primary current goal of large European utilities is getting larger and heading towards oligopolies.

An important issue in this context is the resulting shut-down process of excess capacities. If excess capacity exists and utilities compete at least to some extent the price they receive for electricity will only be equal to the short-run marginal costs (SRMC). 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, either the price will be set strategically and might be substantially

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Figure 4

The ambiguous role of shut-down excess capacities



higher than under competition, especially if demand is very inelastic. And the large German utilities E.ON and RWE have already announced that they intend to close substantial capacities.

Table 1

Major mergers, acquisitions and share purchases in Europe 1995- 2001

Acquiring Company	Acquired Company	Share
EdF	London Electricity (UK)	100%
EdF	SWEB generation, supply (via London Electricity)	100%
EdF	ESTAG (A)	25%+1vote
EdF	EnBW (D)	25%+1vote
Vattenfall (S) (via Vasa Energy)	Stadtwerke Rostock (D)	12,55%
Vattenfall (S)	HEW (D)	25%
Texas Utilities (US)	Eastern (UK)	100%
ScottishPower (UK)	Manweb (UK)	100%
ScottishPower/PacifiCorp (UK)	ScottishPower, PacifiCorp (UK)	merger
National Power (UK)	Midlands Electricity (UK)	100%
PowerGen (UK)	East Midlands Electricity	100%
Preussen Elektra (DE)	EZH (NL)	25%
Scottish Hydro Electric	Southern Electric	100%
PNEM-MEGA	PNEM/MEGA Limburg	merger
EnBW (D)	EVS/Badenwerk	merger
BirkaEnergi (SE)	Stockholm Energi/Gullspang	merger
Electrabel (BE)	EPON (NL)	40%
E.ON (D)	Preussen Elektra/Bayernwerk (D)	merger
RWE (D)	VEW (D)	100%
Vattenfall(S)/HEW(D)	VEAG (D)	51%
E.ON (D)	PowerGen (UK)	100 %
E.ON (D)	Sydskraft (S)	51 %
RWE (D)	KELAG (A)	22 %
E.ON-Hydro (D)	Austrian Hydro Power (A)	merger

Figure 6 depicts the development of electricity generation prices in major European markets. It can be seen that there are considerable differences between different markets. The UK pool price is three times higher than the cheapest market, the NordPool. Yet, in recent months the prices in the NordPool have caught up, mainly due to looming capacity shortages. Also the Spanish pool price is higher than the average. The electricity price at the new German bourses EEX (Frankfurt) and LPX (Leipzig) is lower than the Spanish and English pool price. But it has caught up considerably over the last two years.

Market Imperfections Due to a Lack of Regorous Unbundling

Currently due to a lack of rigorous unbundling market power of generators over the grid is a major obstacle for a real competitive electricity market. Especially in Germany and France

Figure 5

Ranking of the largest European electricity generators in 1999 and 2001. Source: annual reports.

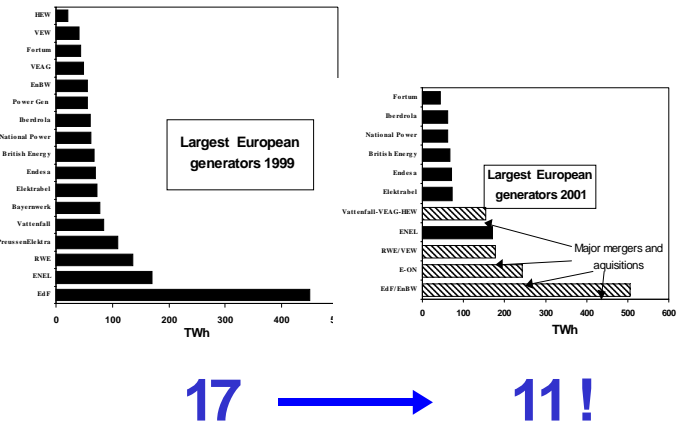
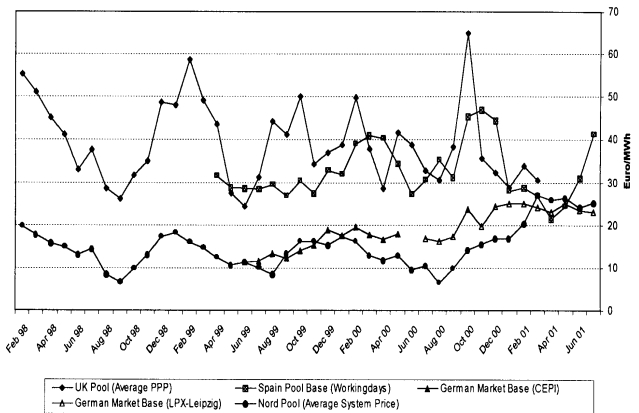


Figure 6

Development of Electricity Generation Prices in Major European Markets

Monthly Average of Selected European Spotmarket Prices (Jan 1998 - Jun 2001)



it is likely that incumbent generators will retain market power over the transmission grid over the next years. The major problem in Germany is that due to private ownership of the large vertically (generation + transmission) integrated utilities it is virtually impossible to achieve a rigorous unbundling. On contrary, the majority of EU countries have implemented at least fully legal unbundling. Moreover, in Scandinavia, UK and Spain there exist separate grid companies, see Table 2 and Figure 7.

Competition in various EU member countries is further curtailed by high transmission fees and differences in transmission pricing models. Figure 8 compares the share of transmission and distribution costs in selected Western European countries in 2000 for residential customers. As can be seen they vary tremendously. On the one hand, they are still high in recently liberalised markets like Austria and Germany. According to the announcements of the regulatory bodies in these countries they are expected to decrease in the future. On the other hand, in Norway the transmission and distribution charges are extremely low. As a consequence, currently less investment to maintain the grid is taking place. In order to change this situation in the future, charges for transmission and distribution have increase.

Table 2

Type of unbundling and access to the grid in several EU member countries incl. Norway in 2001 (rTPA...regulated third party access, nTPA...negotiated third party access, SB...Single Buyer model).

Electricity Mkt. EU Country	Unbundling 2001	Access to GRid 2001
Austria	Legal (AGP); Mgmt. (TIWAG,VKW)	rTPA
Belgium	Legal ¹	rTPA
Denmark	Legal	rTPA
Finland	Ownership	rTPA
France	Management	rTPA
Germany	Management	nTPA
Greece	na	rTPA
Ireland	Legal	rTPA
Italy	Legal	rTPA...eligible customers SB(rTPA)...captive customers
Luxembourg	Management	rTPA
Netherlands	Legal ²	rTPA
Norway	Ownership	rTPA
Portugal	Legal	rTPA...eligible customers SB(rTPA)...captive customers
Spain	Ownership	rTPA
Sweden	Ownership	rTPA
UK	Ownership (E&W);Mgmt. (Scotland, Northern Ireland)	rTPA

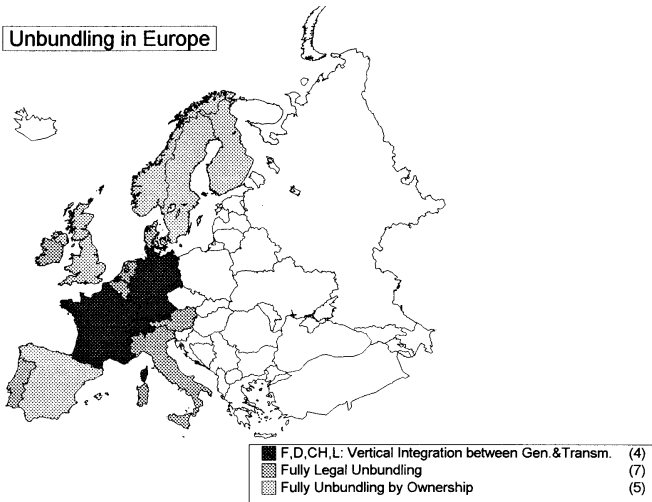
1 Belgium: although the TSO has not been nominated yet.
2 The Dutch state intends to buy the majority in the Dutch TSO, which will then be unbundled in ownership terms.

Development of Prices for Final Customers

Of special interest, of course, is how prices differ between countries and how prices changed over different periods in the past.

Figure 7

Degree of unbundling of the transmission grid in Western Europe 2001

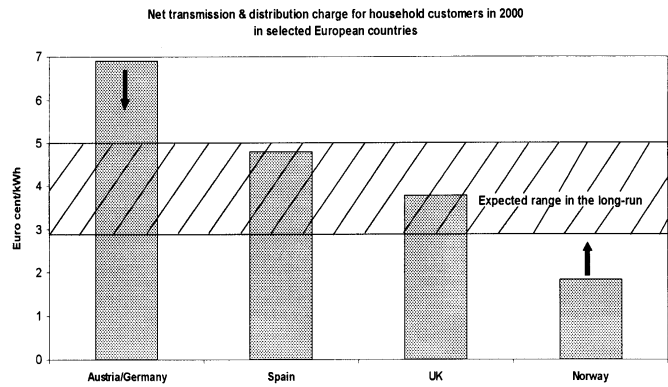


We first look at current price structures in EU countries as depicted in Figure 9a and 9b. As can be seen prices for households as well as for industry still vary tremendously between different EU countries. In January 2000 in Western Europe electricity prices differ in the residential sector between 0.06 •/kWh (Finland) and 0.15 •/kWh (Italy) and in the industrial sector between 0.038 •/kWh (Nordic) and 0.075 •/kWh (Austria). Hence, the cheapest electricity prices, for industrial customers as well as for households, in the countries investigated, are provided in Scandinavia (Sweden, and Finland.)

In Figure 10 the changes in the electricity prices for households and industry are described.

Figure 8

Share of transmission and distribution costs in selected Western European countries 2000



In Figure 10a and 10b the changes in current prices from 1991 to 2000 is shown for selected European countries. Of course, prices for industry and household are quite different.

Figure 9

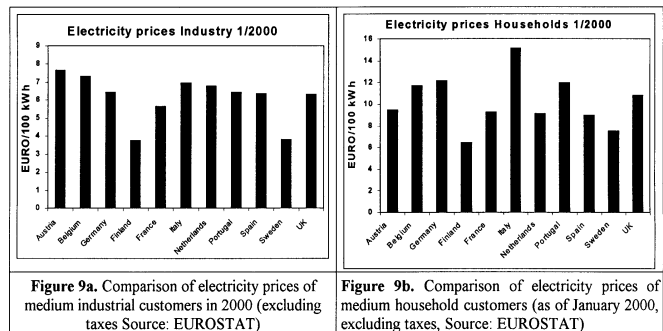


Figure 9a. Comparison of electricity prices of medium industrial customers in 2000 (excluding taxes Source: EUROSTAT)

Figure 9b. Comparison of electricity prices of medium household customers (as of January 2000, excluding taxes, Source: EUROSTAT)

While electricity price development in the household sector is

Figure 10

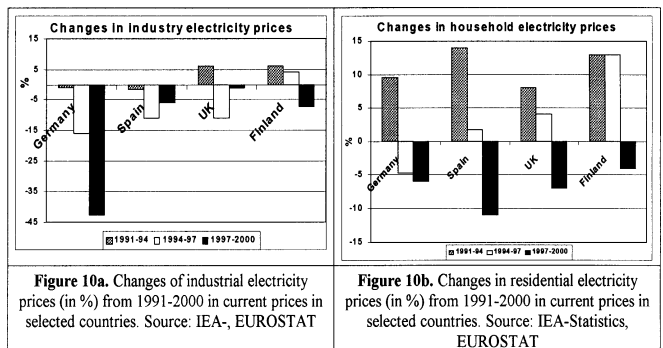


Figure 10a. Changes of industrial electricity prices (in %) from 1991-2000 in current prices in selected countries. Source: IEA-, EUROSTAT

Figure 10b. Changes in residential electricity prices (in %) from 1991-2000 in current prices in selected countries. Source: IEA-Statistics, EUROSTAT

rather inhomogeneous among the different countries, industry prices decreased over the last decade in all countries.

Worth mentioning is the German situation: the price reductions are not only due to the restructuring of the ESI. If we look at German electricity price developments from 1994-1997 instead of 1991-1994 in the industrial sector a decrease of 10% can be observed. Since in Germany in 1996 the so-called "Kohlepfennig" - a tax on customers bills - was cancelled (which

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had to be paid by all customers) resulting in substantial electricity price reductions of up to 24% for industrial customers.

The above analyses provide evidence, that in Western Europe short-term electricity prices dropped substantially due to liberalisation and competition (but not for all customer groups to the same extent).

Future Perspectives

Most of the arguments raised above indicate that electricity prices in Europe will start to increase soon. There are some further aspects which support this argument:

- Increasing dependence on natural gas and increasing natural gas prices
- Increasing horizontal integration
- Volatile production from hydropower
- Increasing reliance on imports
- no incentives for building new capacities

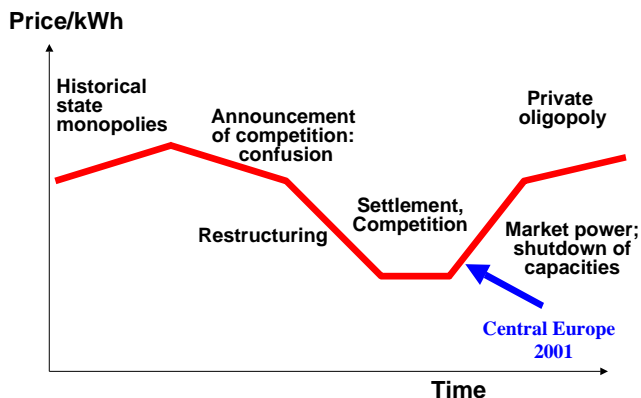
Summarising all arguments, it is likely that the development of electricity prices over time in liberalised markets will follow the pattern shown in Figure. 11.

Figure. 12 depicts the recent developments on the wholesale level in Germany from 1999 - 2001. It can be seen that since 1999 wholesale prices have been increasing steadily.

Another interesting case in point is the dynamics of

Figure 11

Evolution of electricity prices over time (in principle) in liberalised electricity markets.



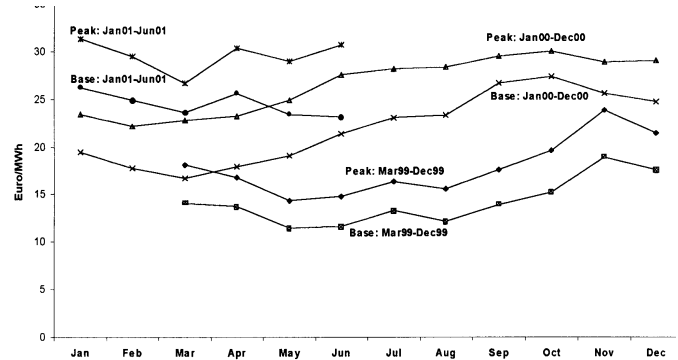
various developments. Previously the fundamental conditions for competition in electricity markets have been summarised. With respect to these different conditions, currently the basic strategy of incumbent utilities in Western Europe appears to be as follows: There are two phases:

- In phase 1 competition would be possible because of excess capacities and a sufficient number of generators existing. But it is curtailed by barriers for access to the grid, barriers for changing suppliers and limited market opening in some countries. Hence, barriers are maintained to postpone real competition until there is no relevant number of competing suppliers available.
- In phase 2 when finally the most pressing problems regarding access to the grid and customer switchover are settled (e.g., due to the so-called "Florence-Process") competition will no longer be possible because of a lack of generators and

Figure 12

Recent development of wholesale electricity prices in Germany 1999-2001

Monthly Average Spot market Prices (day-ahead) in Germany from March 1999-June 2001



excess capacities as well as competing suppliers.

Conclusions

Policy makers and the public in Western Europe are currently still blinded by the recent drops in electricity prices. Yet, how long will the currently expected increases in competition and the observed decreases in prices continue?

The major conclusions of this analysis are:

- A major condition for competition are many generators. Yet, in Western Europe currently the number of generators decreases continuously mainly because of strategic alliances and mergers.
- Cheap electricity prices can be sustained only if excess capacities are available. We predict that after the dust of merging, acquisition and share purchasing has settled, sooner than many expect, capacities will become scarce in Western Europe. Thereafter, prices will become more volatile and increase substantially;
- Competition requires a rigorous separation of market elements where competition is possible (generation and supply) and parts which remain natural monopolies (transmission grid). Unbundling of generation and transmission by means of separate accounting as currently practiced in various countries is not sufficient for real competition!
- Full privatisation of utilities is not relevant for introducing competition;
- Yet, the developments described above also provides new opportunities, especially for more efficient use of electricity and for decentral generators. The gap between decreasing large "old" capacities and increasing demand has to be met by increases in energy efficiency and new decentralised generation facilities. These will be based most favourable on renewable energy sources. High electricity prices will, of course, support these developments.

Finally, we note that liberalisation is not the target but a means. Or as John Chesshire put it "Liberalisation is a means, not an end!"

References

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