

A comparison of electricity market models of CEE new member states

by

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ABSTRACT

This paper discusses the current state of the electricity industry in the five new EU members that also belong to UCTE – the Czech Republic, Hungary, Poland, the Slovak Republic and Slovenia. It outlines the current status of these industries, and discusses the potential for creating a competitive regional market, given the generally uncompetitive structure within each country.

These countries are physically integrated with the west European grid, and have taken the first steps towards adopting the “western model” with regulated third party access for the larger customers, partial privatisation of companies within the industry (except in Slovenia) and reducing barriers to international trade. However, most of the countries has a highly concentrated generation sector, which means that the wholesale markets are generally uncompetitive and thin. Even where the sector looks less concentrated, in Poland and Hungary, long-term power purchase agreements have tied up much of the potentially free capacity.

The paper reveals obstacles to increased competition at the domestic as well as at the cross-border level.

The paper offers a dominant price leadership-style model for understanding domestic electricity market structures in the CEE region. Major players are the dominant wholesalers and a competitive fringe. Dominant companies that are large on a national basis would be small or at most medium-sized on a regional scale. However, the vested interests of the dominant incumbents in the region would encourage them to fight against greater competition. Practices that would allow them to do so (and are therefore bad) include long-term import or export contracts that reduce the available transmission capacity over the borders, priority access to low-cost power sources such as nuclear stations, and the willingness of state owners to accept low profits, allowing the possibility of predatory actions.

Finally, the paper promotes the idea that stronger competition on a regional level might offset the unsatisfactory domestic market structures.

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1 INTRODUCTION

The purpose of this paper is to provide an assessment of electricity market developments in the five new member states of the EU, which are at the same time UCTE members: Czech Republic, Hungary, Poland, Slovak Republic (the four CENTREL countries) and Slovenia.² The review is carried out from the perspective of a potential Central European electricity market integration that would fit the requirements of Directive 54/2003/EC and connected regulations. After summarising the essential features of the developing national market models, I try to identify those model elements that might object competition on the domestic markets and / or in the region, primarily at the generation and wholesale levels.

In 2003, 70% of electricity was generated on conventional thermal basis (mostly coal), 20% on nuclear in the five countries in question. Gas accounted for 6%, hydro based generation for 4%. Electricity generation by renewable sources, other than large hydro, is still marginal in these countries (Table 1 and Figure 1). Coal is the dominant fuel type in Poland and the Czech Republic. Nuclear plays an important role in Slovakia, Hungary and Slovenia. Gas based electricity production plays the most important role in Hungary and hydro plays an important role in Slovakia and Slovenia. Despite the dominant role of coal based generation, we find a wide variety of generation technologies and connected production costs for generation in the region. While, in principle, such a variety in the marginal cost of generation is a favourable precondition for effective competition, we also find a variety of special treatment for certain types of generators that, directly or indirectly, protect generators from straight competition. Such treatment is typical for renewable based generation, for generation based on local coal (Poland, Hungary), and in some cases for nuclear based generation. Tables 2 and 3 indicate that the CENTREL group, as a whole, has substantial excess capacity in generation and was a net exporter of 21,6 TWh of electricity in 2003.

The data in Table 2. provides an indication about the depth of sector reform and restructuring that took place in the countries in question in the last 14 years. Physical, legal and business level integration with Europe 15 have been comprehensive. The introduction of regulated third party access started in Poland as early as 1998 and was launched in late-comer Hungary in January 2003, but still before EU accession. All the countries have already signed the ETSO CBT agreement and thus became part of the 'tariff-free' European electricity market.

Trade and investment relationships between the electricity industries of the five countries and leading European, and to a smaller extent US, companies have a long tradition. Major German, French, Italian, Swiss, Swedish and British companies have been active in investing into the generating and network businesses in the region. It is perhaps Hungary that went through the most comprehensive privatisation process by selling almost 100% of its distribution business and the rest of its generation companies to foreign investors in the mid 1990s. More recently Slovakia launched an aggressive privatisation program and sold 49% in its distribution business for foreign investors. The sale of 66% of the country's dominant generating company is pending. However, private ownership in the sector is minor in Slovenia, limited in Poland and less important also in the Czech Republic. The most active multinational energy companies in the region are EoN, RWE, EdF, Vattenfal, Atel, Dalkia and Electrabel. To my knowledge, AES is the only major American generating company, which is active in the region.

² The electricity systems of the Baltic states (Latvia, Lithuania and Estonia) are synchronized with the Russian system, while Cyprus and Malta are isolated systems.

A typical, although not at all unique, feature of the newly created electricity markets in CEE is their highly concentrated generation and wholesale markets. Table 3 gives the reader a quick impression on the seriousness of this issue. In Slovakia, Slovenia and the Czech Republic the majority of generation companies are simply owned by the incumbent state owned dominant companies. In Poland and Hungary, while concentration in generation ownership seems less of a problem, the existence of long term power purchase agreements (PPAs) between IPPs and the dominant player repeat the problem at the wholesale level.

A major challenge for sector reform in these countries has been to remove massive price subsidies in general and cross subsidies between industrial and residential electricity prices in particular, inherited from the socialist past. Figures 3 and 4 depict the most relevant price development trends in the CENTREL countries. In dollar terms average industrial prices have more than doubled since the mid 1980s. But the price increase has been really dramatic for household customers: in 2003 Polish customers paid, without taxes, more than five times, Hungarians and Slovaks four times and the Czech three times the dollar price than they paid in 1985 for a kWh. Figures 5 and 6 indicate that the practice of cross-subsidizing household customers by overpriced industrial tariffs was cancelled in each of the countries, but at a very different pace. The ratio between household and industrial average prices increased to 1,2 in Poland already in 1992. The removal of cross subsidies took place in both Hungary and Slovakia as part of their sector reform waves induced by privatisation (1995 and 2001, respectively). The Czech took their 'usual' gradual approach and reached a 'normal' 1,3 ratio in 2002. Figure 6, which is based on the tariff data base collected and published regularly by the Energy Regulators Regional Association (ERRA), confirms these statements for Hungary, Poland and the Czech for the most recent data. However, this data indicates a slower price adjustment process in the case of Slovakia when compared to 'official' IEA data.

Before we conclude that electricity price subsidies are gone in CENTREL countries, let's have a look at Figures 7-10 that were created by the use of the ERRA quarterly tariff data base. As opposed to the IEA data, this data base includes a breakdown of final prices into producer, wholesale and end-user prices. The figures indicate the presence of a practice to use the major state-owned wholesaler companies in the Czech Republic, Poland and Hungary (CEZ, PSE and MVM, respectively) to absorb, at the cost of their profits, increasing producer prices instead of allowing this increase to be reflected immediately in final prices. In Poland the wholesale margin was -9% at the end of 2003, while the Czech and Hungarian wholesaler companies have been run in a 'non-profit' mode recently. In this context the loss making of CENTREL wholesalers can be, at least in an economic manner, considered as hidden state subsidies that might significantly distort future electricity market competition both at local and at a regional level.

The case for Slovakia is different. If we can believe the data, the Slovak regulation allowed for an increasing wholesale margin for SE, the Slovak incumbent, and also for a fairly generous distribution and retail margin for the newly privatised distribution companies. Thus, major final price increases took place in Slovakia in times of decreasing producer prices. Increasing wholesale margins for SE could potentially be explained by the preparation of SE for privatisation by the government. Nevertheless, more analysis of the data is needed to arrive at a conclusion here.

Note also that the average producer price in the group has recently fluctuated between 3 and 4 US cents. The exception is Hungary, where average producer prices are significantly higher and exceed 5 US cents/kWh in 2004.

Though the national wholesale markets across the region are dominated by bilateral deals, the establishment of electricity exchanges in Poland, the Czech Republic and Slovenia have helped in improving price transparency on these national markets. Figures 11 and 12 indicate a strong trade integration between the German, Slovenian and Czech free wholesale markets. The significantly higher Polish exchange price indicates local market power problems for this market.

Finally, as an essential feature of energy sector reform, energy regulatory commissions and authorities were established in each of the investigated countries (see Table 5). Note, that the level of authority, autonomy and accountability that characterizes these institutions make them at least as strong players in this field as their EU 15 counterparts.

Now I turn to a brief discussion of the individual national markets.

2 CZECH REPUBLIC

The Czech Republic began restructuring its electricity industry in 1992. The former CEZ was broken up into a dominant generator Czech Power Company (CEZ), which also operated the transmission network, and 8 regional distribution companies. All 9 companies were transformed into joint stock companies, and CEZ was 30 per cent voucher privatized in the same year. In 1995, foreign investors and municipalities received minority stakes in the regional distribution companies. (OECD, 2001; Paizs, 2000)

Although privatising the majority of shares of CEZ was, for a long time, the intention of the Czech Government, the deal has not been realized as yet because of unsuccessful bidding rounds. At present the restructured CEZ has an expansive growth strategy. As the second largest exporter of electricity in Europe, CEZ intends to become the dominant regional electricity company in CEE.

Before January 2001, the contractual relations of the Czech electricity industry were organized according to the *purchasing agency model*. This means that the CEZ, who also acted as a monopoly provider of transmission and power dispatch, retained the statutory monopoly over the wholesale activity. There was no third party access to the grid; neither domestic producers nor generators abroad could sell power directly to the distribution companies or end-users of electricity. Similarly, there was no open access to the distribution lines.

After adopting the State Energy Policy Guidelines in 2000, the Energy Act (458/2000) came into force as of January 2001, which set the regulatory framework for the energy market liberalization. The Act was amended by the Act 256/2003.

Unbundling of the TSO is in a contradictory stage in the Czech Republic. CEPS is the licensed transmission operating company of the Czech Republic. Until April 2003, CEPS was 100% owned by CEZ. By April 1, 2003, 51% of the shares of CEPS was transferred into the

ownership of the state company Osinek, and another 15% stake into the ownership of the Ministry of Labor and Social Affairs of the Czech Republic. The Ministry of Industry and Trade of the Republic was appointed as the administrator of the shareholders rights (CENTREL, 2004). The principles of CEPS's activities are defined in accordance with Act No. 458/2000 ("The Energy Act") and the Grid Code approved by the Energy Regulatory Office.

Some competition seems to exist on the balancing and ancillary services market organized by CEPS. Nine domestic and two foreign providers supply CEPS, as a monopoly buyer, with such services at present. Transmission losses, purchased also by CEPS, are provided by CEZ and the Polish dominant wholesale company, PSE.

Pursuant to the stipulations of the Act, the Czech Energy Regulatory Office (ERO) was set up in January 2001. The ERO responsibilities include granting licenses for the business activities in the energy sector; setting prices for electricity, gas and heat and for services in the energy sector; setting up the framework for the third party access to the electricity and gas grids. The ERO is financed from the national budget.

Also the Electricity Market Operator (OTE), a body in charge of collecting electricity supply and demand information, as well as organizing a spot electricity market started to function in July, 2001 (ENVIROS, 2003)

2.1 Demand

Aggregate demand for electricity in the Czech Republic was 67 TWh in 2003. Domestic gross production added up to 83 TWh, thus the country was a net exporter of 16 TWh in this year. Distribution companies are eligible consumers.

2.1.1 Eligibility

The sequence of demand side electricity market opening in the Czech Republic is summarised in table 6.

Table 6. Eligible consumers in the Czech Republic

| Eligible consumers | Market opening in % | In effect |
|--------------------------------|----------------------------|------------------|
| Consumers > 40 GWh/y | 30 | January, 2002 |
| Consumers > 9 GWh/y | 40 | January, 2003 |
| <i>Consumers* > 1 GWh/y</i> | 45 | January, 2004 |
| Consumers > 100 MWh/y | 55 | January, 2005 |
| All end users | 100 | January, 2006 |

Sources: Energy Act, in: OECD 2001, p. 18.

*inserted step after the amendment of the Energy Act (256/2003).

After January 1, 2003, the number of eligible customers increased from approx. 80 to 450, although incumbent suppliers have managed to keep the majority of eligible customers by offering them advantageous terms of supply. It was estimated that eligible customers could

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save around 6% of their electricity costs due to price drops.³ Amendment 256/2003 of the Energy Act have accelerated the degree of gradual liberalization. An additional step was inserted into the schedule: from January 1st, 2004, buyers consuming over 1 GWh were granted authorization to buy electricity from the market.

2.1.2 The size of the independent retail market

Market opening created the possibility for consumers and distribution companies to purchase electricity from agents (domestic or foreign) other than CEZ. We might consider that independent purchase as the “competitive fringe” of the domestic electricity market. We estimated the share of retail purchases being independent from CEZ sales in 2003.⁴ Sources for such purchases are imports and purchases from domestic IPPs. We estimate that 26% of retail purchases (cc. 15,7 TWh) were independent from CEZ sales in 2003, 11% of which came from (net) imports of the independent fringe of the market. Interestingly, while the country as a whole, and also CEZ is a major net exporter of electricity, the competitive fringe of the market was a net importer of 1,7 TWh last year.

2.2 Price regulation for access and for the captive market

ERO is responsible for setting network access prices in the Czech Republic and also for establishing tariffs for captive consumers. We are not aware of major obstacles for eligible customers to move between the free and the captive segments of the market.

Wholesale prices are pegged closely to the neighbouring German market because of strong CBT activity. CEZ usually offer at a rate competitive with Germany. CEZ also have a strong influence on prices in Poland (Platts, 2004a).

As we have already indicated, the Czech Energy Regulatory Office eliminated subsidies for household electricity prices in 2002. (EIA, 2003)

2.3 Supply

The supply side of the market is concentrated in the Czech Republic. While there are about 25 large (>50MW) power stations around the country, state owned giant CEZ owns 70% of installed capacity. There are also independent power and heat companies present in the country. The biggest are: Elektrany Opatovice (installed capacity 360 MW), Energotrans (352 MW), Dalkia Morava (346 MW), Chemopetrol (almost 298 MW), ISPAT (254 MW), United Energy (236 MW) and Sokolovska uhelna (220 MW).

³ „Another wave of liberalisation”, News at SEVEN, Vol. 11, No. 1, March 2003

⁴ For such estimations we have made use of the electricity balances of the countries and that of the dominant companies. For example, in the Czech case we calculated the net import position of the competitive fringe by re-ordering the following balance equation:

$GEN_{ceZ} + IMP_{ceZ} + GEN_i + IMP_i = OC_{ceZ} + OC_i + LOSSES_{ceps} + OS_{ceZ} + RETAIL_{ceZ} + RETAIL_i + EXP_{ceZ} + EXP_i$,
where GEN is for generation, IMP is for import, OC is own consumption, LOSSES is for network losses, OS is own supply for CEZ generators, RETAIL is sales for retail customers, EXP is for export and the subscription *i* stands for generation or consumption independent from CEZ.

2.3.1 The dominant player

CEZ is clearly the dominant player on the Czech market. The figures in Table 7 indicates this dominant position in all the major segments on the market. Nevertheless, the presence and activities of IPPs in the Czech Republic are clearly superior to that of in the case of Slovakia or Slovenia.

Table 7.

| Market segments | Share of CEZ | Figures for CEZ | Figures for Independent |
|---|---------------------|------------------------|--------------------------------|
| Installed capacity | 70% | 12153 MW | 5191 |
| Domestic production | 74% | 61399 GWh | 21828 |
| Wholesale purchases from domestic producers | 88% | 73177 GWh | |
| Sales for domestic customers / retailers | 74% | 44833 GWh | 15677 GWh |
| Net exports | | 18 TWh | -1,7 TWh |

Source: own estimates

Beyond being the dominant generator and wholesaler, CEZ has a dominant position also in the distribution business (Table 8). CEZ has the majority shares in six out of the eight distribution companies, while German EoN is the majority owner of the remaining two companies (IEA 2001).

According to CEZ Annual Reports, the company seems not to be limited in competing in any of the market segments. CEZ both purchased from IPPs and sold directly to eligible and captive customers significant amounts of electricity in 2003. CEZ was also the sole domestic provider of network losses purchased by its 34% subsidiary TSO company, CEPS.

2.3.2 Cross border trade

The Czech system is strongly interconnected to Poland, Germany, Slovakia and Austria. Import capacity (NTC) is 3,6 GW which is 23% of installed generating capacity (EU Commission, 2004, p.17).

CEZ is Europe's second biggest net exporter of electricity (behind EdF). Since the start of 2003, available transmission capacity at the borders with Germany and Austria has been offered to the free market on a yearly, monthly and daily basis in common auctions. The Slovak TSO (SEPS) joined this system in mid-2003. Some 50 companies have transmission contracts enabling them to nominate capacity in auctions. About 60% of these are active on a monthly basis. An unlimited number of companies can in theory take part in the yearly and monthly auctions, but they cannot nominate unless they have a transmission contract with the grid operator. (Platts, 2004a).

As indicated above, the competitive fringe of the market is in a net importer position.

2.4 Market trading

The free wholesale market is dominated by bilateral contracts. OTE operates a spot market also, but its turnover accounts for only about 2% of generated electricity. (Platts, 2004a)

The Structure of the electricity market is depicted on Figure 13.

3 HUNGARY

The Hungarian electricity industry was a vertically integrated state owned monopoly in 1990. The restructuring of the electricity sector started with the unbundling of the incumbent Hungarian Electricity Trust (MVMT). The company was assembled into a holding (joint stock) company with 15 subsidiaries: 8 generation companies, a transmission company (MVM Rt.) and 6 regional distribution companies. The 1994 Act on Electricity set up a purchasing agency model for the coming years of the electricity sector, and also created a favourable regulatory framework for future privatisation. In this model the transmission company, MVM Rt. was the single buyer with monopoly export/import and wholesale rights.

The Hungarian energy regulatory institution, the Hungarian Energy Office (HEO) was established by the 1994 Gas Act. The main responsibilities of the Office is to prepare administrative prices and price regulation for the Minister of Economy; issue licences for electricity and gas companies; and to deal with sector specific consumer complaints.

At the beginning of 1995 the government of Hungary decided to sell the electricity companies to strategic investors, and accomplished the rest of this plan in just nine months. As a result, today the sector is controlled by numerous private strategic investors (as a result of massive privatisation in the mid 1990s) and the incumbent, still state owned transmission company, the former single buyer MVM Rt. Transmission and generation that remained unsold (including Paks Nuclear Plant, the only nuclear generation company), plus a portfolio of long term power purchase agreements (PPAs) between MVM, domestic generators and foreign traders makes up today MVM Rt.

Since transparent and cost reflective price regulation was missing at the time of privatisation, the massive use of long-term (15-20 years) PPAs was a major mean of the Hungarian electricity sector privatisation process. PPAs were also used to contract long-term imports and stimulate major green-field developments in 1995 and 1996 (Csepel) and even around the end of 2001 (Újpest, Kispest, Tisza, Dunamenti). Figure 14 illustrates the impact of PPAs on the supply side of the Hungarian market.

Naturally, these PPAs are major obstacles to supply side competition in a liberalized context. They also served as the basis for the stranded cost compensation scheme that was developed in parallel with market liberalization recently. The scheme is still to be tested against Community competition law.

Price adjustment from social to cost reflective retail prices was accomplished mostly between 1995-98. Transparent price regulation started with a 4 years price cap regime between 1997-2000 and continues with a second term of 2001-2004.

By the adoption of Act CX of 2001 (the Electricity Act: VET) in December 2001, the liberalisation of the electricity sector started in Hungary. The Act came into force on January 1, 2003.

The legislation that opened the way for free consumer choice has accomplished two major things. First, it put the most important and progressive preconditions for competition in place. Most of all, it created a cost-reflective regulated TPA regime for system users; unbundled, in a legal way, the Independent System Operator (MAVIR Rt.) from the incumbent monopolist MVM Rt.; liberalised cross border trade⁵ while putting interconnection auctions in place where it was feasible to do so; and created relatively easy entry conditions for new traders / suppliers into the sector. Second, it created an unusual an inflexible public service segment. According to this regulation, captive customers and eligible customers that opted to remain in the public supply segment are supplied through a single buyer-like system. Supply obligation is put on generators holding long term PPAs with MVM to supply MVM *as* the Public Utility Wholesaler (PUW) and on MVM to supply regional Public Utility Suppliers (PUSs), and finally on PUSs to supply captive consumers. PUW and PUS prices and tariffs are set administratively by the Minister of Economy and Transport.

3.1 Demand

Aggregate demand for electricity in Hungary was 41,1 TWh in 2003. Domestic gross production added up to 34,2 TWh, thus the country was a net importer of 6,9 TWh in this year. Net electricity consumption was 34,3 TWh, from which the consumption of free market consumers accounted for 4,2 Twh (VESTÉK, 2004).

3.1.1 Eligibility

The sequence of demand side electricity market opening in Hungary is summarised in Table 8.

Table 8. Eligible consumers in Hungary

| Eligible consumers | Market opening in % | In effect |
|-----------------------------|----------------------------|------------------|
| Consumers > 6,5 GWh/y | 35 | January, 2003 |
| All non-household customers | 65 | May, 2004 |
| 3.1.2 All end users | 100 | July, 2007 |

The Hungarian electricity market had a smooth take-off in 2003. After the legal framework had been put in place by January 1, a lively demand side development indicated that the newly licensed traders and eligible consumers could live with the rules of the game. While the market was opened up to 35% in principle, about 18 % of consumption changed actually supplier. All customers (consumption sites) over 100 GWh annual consumption have entered the market.

⁵ Full liberalization is in effect from May 1, 2004.

There are two important characteristics of the demand side of the Hungarian electricity market that are important to note.

First, in Hungary eligibility and the connected right for rTPA is restricted to industrial and commercial customers, generating companies and licensed traders. A peculiar feature of the system is that neither the regional distribution companies nor the public utility suppliers are allowed to choose their suppliers: they are obliged to purchase from MVM Rt.

Another remarkable characteristic of the Hungarian model is that for an eligible customer the decision to move from the administratively priced captive to the free market segment and *vice versa* is an almost costless one. Thus, the advantage of the free market can last only until it is cheaper than public service. Simply, the size of the competitive free market segment is determined by the relative prices on the free market and of public supply.

Figure 15 seems to illustrate the above statement: by the beginning of market opening, new and relatively cheap import opportunities and simultaneous administrative price increases made the free market attractive for eligible customers. A weak national currency (HU Forint), the unexpectedly high annual (2004) auction prices at the most important interconnectors, and an administrative price decision in January 2004 that increased the relative price of network access encouraged 4% of the market to return to the public supply segment. As the national currency recovered and monthly auctions corrected down interconnector prices to realistic levels, the c. 20% free market size recovered.

3.1.3 The size of the independent retail market

We estimate that about 15% of retail purchases (5963 GWh) was independent from MVM sales in 2003. Imports accounted for 44% of this figure and domestic production for 56% (see Table 9).

3.2 Price regulation for access and for the captive market

In the Hungarian case the fair, non-discriminatory and transparent pricing of third party access was ensured by the publication of the ministerial decree No. 57/2002 (XII. 29) of the Minister of Economy and Transport. The methodology and the actual rates for network pricing was established and calculated by the regulatory authority HEO. The proposal of the Office was accepted and published in the ministerial decree.

For ensuring non-discrimination, administrative and bundled retail prices for captive consumers are calculated in a manner as if they were paying the same access price as free market consumers do actually pay.

For transmission a pure price cap, for distribution a service quality adjusted price cap, and for system use charges an annual rate setting system were in place until December 31, 2004.

According to the opinion expressed in a report of the HEO, the model of network access at regulated and administrative prices, which was introduced in Hungary, is proven to be operable in respect of both its structure and the rate of network and system operation charges.⁶

⁶ See 'The first six months of the electricity market' (2003), www.eh.gov.hu.

3.3 Supply

Installed generation capacity amounts up to 8300 MW in Hungary, while peak demand for electricity is around 6000 MW.

At the ownership level, the Hungarian generating sector belongs to the less concentrated ones in CEE. We find 5-6 major players on the market (state owned MVM / Paks nuclear, Electrabel, AES, ATEL, RWE, Edf, EoN). Nevertheless, MVM has a purchasing option for capacity and electricity included in the PPAs. Thus, if we take PPAs into consideration, the wholesale market can be characterised as concentrated as generation in Slovakia or in the Czech Republic.

3.3.1 The dominant player

The dominant player of the Hungarian market is MVM Rt. The company stabilized its overwhelming shares both in wholesale purchase and in sales for (retail) customers.

Table 9.

| Market segments | Share of MVM | Figures for MVM | Figures for Independent |
|---|---------------------|------------------------|--------------------------------|
| Wholesale purchases from domestic producers | 89% | 28289 GWh | 3343 GWh |
| Sales for domestic customers / retailers | 85% | 32619 GWh | 5963 GWh |
| Net exports | | - 4330 GWh | - 2620 GWh |

Source: VESTÉK, 2004 and own estimates

In order to prevent the unfair operations of a market player having a dominant production portfolio contracted and also certain monopoly rights, the law obliges the PUW (MVM) not to interfere with open market operations and to put its excess contracted capacity⁷ on transparent (virtual) auctions. The company is also allowed to collect a stranded cost compensation on proved losses it suffered as a consequence of such auctions.

Nevertheless, MVM seems to play around these rules. In its strive to dominate the complete domestic wholesale electricity market, the company has been successful in optimising the amount of capacity put on public auctions from its own perspective.⁸ Such a capacity rationing helps MVM to control free market prices through regulating supply for it. The result is a shorter than socially optimal supply of capacity for the free market and a higher than optimal price for free market customers. At the same time, MVM is also present on the free retail market segment through its market trader subsidiary, MVM Partner and, as other traders, strives to gain a major market share.

3.3.2 Cross border trade

⁷ I.e. in excess of proven public service needs.

⁸ A supply shock, namely the termination of generation in one of the four nuclear units at Paks after a 3 level accident in April 2003 that has decreased the base-load capacity by 400 MW for now more than a year has clearly added to this effect.

The Hungarian system is well interconnected to Slovakia, Ukraine, Austria, Croatia, Romania and Serbia. Import capacity (NTC) is 1,8 GW which is 22% of installed generating capacity (EU Commission, 2004, p.17). It is important to note that about 40% of the available interconnection capacity is allocated on the basis of long-term import contracts that were concluded between MVM and foreign energy traders in the mid 1990s.

The country is a net importer (10-20%) and an important transit country. The typical flow is from North to South (from Ukraine and Slovakia to Croatia, Serbia and Italy). This is not surprising if we notice the relatively high domestic producer price level as compared to neighbouring countries (see figures 7-10). Increased access to interconnectors and to enlarged imports was a major force to push market development ahead in Hungary. This is reflected in the fact that the net imports of the country was doubled from 2002 to 2003.

The principle guiding the relevant CBT regulation is that whenever an interconnection becomes congested and an agreement can be found with the neighbouring system operators, the preferred allocation method for the available transmission capacity (ATC) is an explicit auction. The ISO (MAVIR) is responsible for designing and running the auctions. And indeed, a significant share of ATC of congested interconnections are allocated through regular annual and, from January 2004, monthly auctions by MAVIR Rt. For information on auction results, visit www.mavir.hu.

3.4 Market trading

By the end of 2004, there were 21 electricity traders licensed by the HEO. The free wholesale market is dominated by bilateral contracts. Daily day-ahead trading by traders aim at minimizing the purchase of - highly priced – balancing energy by balance groups.

4 POLAND

Before 1990, the Polish electricity industry was organized in five vertically integrated regional utilities. In 1990, the regional utilities were broken up into 32 generation, one transmission, and 33 distribution enterprises. The Polish Power Grid Company (PSE, Polskie Sieci Elektroenergetyczne) was established as a Treasury joint stock company in 1990, while the distribution and generation companies were corporatized in 1993 and 1994, respectively. (Paizs, 2000)

The Energy Act of 1997 opened the way for liberalizing the Polish electricity market. The Act allowed a choice for eligible consumers to purchase electricity from suppliers other than grid companies. The Act also established the Energy Regulatory Office (URE). The URE is responsible for licensing, enterprises in the gas, electric and district heating sectors, tariff setting, establishing quality of service standards, consumer protection, promoting competition and energy efficiency.

Regulated TPA is in place in Poland. Network tariffs have to be submitted by the grid companies to the Regulator for approval. Nevertheless, URE is reporting a relatively low level of propensity for eligible customers to switch supplier, partly due to the discriminatory behaviour of grid companies (in Platts, 2004, p. 59).

In Poland 94% of the 33,6 GW installed electricity generating capacity is based on coal. The remaining 6% is installed in hydro generation and in other RES. Main generators include 17 large system power plants and 19 CHP plants (Eurelectric, 2004). The fact that to date URE issued 122 generating licenses for sources with capacity of 5 MW or more indicates the presence and importance of smaller generators in the Polish system. Besides PSE, major market players on the generation side include Elektrim, BOT, G-8, Elektrownia Rybnik, Electrabel, EDF/ENBW, Eon, Atel (Platts, 2004c).

In the distribution sector there are now 29 distribution companies, and a further consolidation is under way.

PSE-Operator S.A., which was established on July 1, 2004 by a de-merger from PSE SA is today the transmission system operation company.

Four major power stations from 17 (cc.20% of total capacity), 9 CHP plants from the 19 and 2 distribution companies form the 29 have been privatised to date. Beyond that the Polish electricity sector remains state-owned.

In May 2004, 291 companies were licensed to trade electricity in Poland, including all the major European utilities.

4.1 Demand

Aggregate demand for electricity in Poland was 140,6 TWh in 2003. Domestic gross production added up to 150,8 TWh, thus the country was a net exporter of 10,2 TWh in this year (15,1 TWh exports and 4,9 TWh imports) (URE, 2004, p.6 and Eurelectric 2004, p. 58).

4.1.1 Eligibility

The sequence of demand side electricity market opening in Poland is summarised in table 10.

Table 10. Eligible consumers in Poland

| Eligible consumers | Market opening in % | In effect |
|---------------------------|----------------------------|------------------|
| Consumers > 10 GWh/y | 37 | January, 2002 |
| Consumers > 1 GWh/y | 53 | January, 2004 |
| All end users | 100 | January, 2006 |

Sources: URE Annual Report (2004), p. 10.

After January 1, 2002 the number of eligible customers was about 641, although incumbent suppliers have managed to keep the majority of eligible customers by offering them advantageous terms of supply. From January 1, 2004, the number of eligible customers increased to 6000. URE estimates that 'independent' purchase accounted for about 6,5% of the sales of distribution companies to final consumers in 2003.

Since we could not get the consolidated figures of PSE for the year 2003, we could not estimate the size of the independent retail market as in the case of other CENTREL countries.

4.2 Supply

There are a number of significant generating companies on the Polish market, both private and state owned. Nevertheless, as it was already referred to, these ‘independent’ producers are linked to the wholesaler PSE with long term PPAs. As opposed to the Hungarian case, where PPAs were linked to privatisation transactions, the Polish PPAs are linked to investments aimed at retrofitting major polluting generators in order to comply with EU emissions standards.

4.2.1 The dominant player

PSE SA is clearly the dominant wholesaler on the Polish market. Today PSE SA is organized into a holding structure. PSE is the parent company of PSE Capital Group (GK PSE), one of the largest business groups in Poland. PSE plays a key part in the management and restructuring of GK PSE, setting its development and expansion policies, as well as in building its equity value. Being a parent company, PSE has an important role in the process of building a strong power supply system within Central and Eastern Europe

Through de-merging the Transmission System Operation unit to a separate company, PSE-Operator S.A., established on July 1 2004, PSE ensured the separation of electricity sales from transmission services. In the transition period, i.e. until the end of 2004 or longer, PSE SA shall remain the owner of material transmission assets leased to the OSP (transmission system operator).

PSE is thus a transmission and a wholesaler company. About 65% of Polish generation is sold on long term PPAs with a minimum off-take obligation to PSE. A further 12,4% is obligatory feed-in CHP and 2,85% is renewable obligatory feed-in.

PSE has also had an export-import monopoly until May 2004.

According to the statement of PSE, for the duration of the 35 long-term electricity purchase contracts, PSE shall remain a party to these contracts, as well as to contracts involving international electricity sales and their related energy purchase contracts in domestic market (www.pse.pl). Thus, the contracts provide a dominant position for PSE on the domestic wholesale market.

PSE is also the operator of the balancing market. Platts (2004c) reports that restrictive rules to participate at the balancing market is a major obstacle to real competition in Poland.

4.2.2 Cross border trade

Poland is a major European exporting country. The Polish system is strongly interconnected to Slovakia, Czech Republic, Germany, Sweden, Belarus and Ukraine. Import capacity (NTC) is 3,5 GW which is 10% of installed generating capacity (EU Commission, 2004, p.17). The German market is a natural target for Polish electricity exports. However, the rules related to the access to interconnecting capacities are quite unclear. PSE had a monopoly export-import right until May 2004. Until this time an explicit auction with a German control area had been in place. Since then the auctioning system is on hold. In general, transparent and non-discriminatory access to Polish interconnection capacities is still to be established.

4.3 Market trading

The free wholesale market is dominated by bilateral contracts and trade. On the exchange based wholesale segment trade is carried out on the basis of standard contracts. Prices resulting from these transactions are public. Finally, the settlement prices of the transactions taking place on the balancing market are published and available for all interested parties.

5 SLOVAKIA

Despite the fact that the Slovak Parliament has passed a legislation that made the country's electricity sector legislation to comply with the 54/2003 Directive in October, 2004, Slovakia has indeed created almost all the necessary institutions, or even more, that are required by the Directive for promoting electricity market competition.

Most importantly, SEPS, a legally unbundled, 100% state owned transmission system operator (TSO) was established in January 2002. The role of SEPS in granting access to the system is crucial. Beyond being responsible for transmission, balancing and dispatch of electricity, SEPS provides ancillary services to system users and controls access to interconnectors. Network access, balancing, dispatch, and operations of the network are governed by the Grid Code and the Commercial Rules of the TSO. Both the Code and the Rules were prepared by the TSO and entered into force after approval by the Regulatory Authority.

The Regulatory Authority of Network Industries (URSO) started its operation in August, 2001. URSO is responsible for regulating, among other things, the electricity and gas industries and its status is characterized by a level of autonomy, authority and accountability that is a precondition for an "independent" regulator. An indication of this is that the Regulatory Council and URSO has survived two dramatic energy price increases and the consequent political battles in 2002 and 2003. URSO, in times of the privatisation of the three regional distribution and supply companies, created a transparent and cost reflective access pricing system.

A system for accounting for balancing energy was established by January 2004. Nevertheless, this segment of the market is in an embryonic stage. On the supply side of the system we find a monopoly provider of balancing energy and ancillary services. Supply is priced by the regulator. Market customers can contract for balancing energy directly with SEPS or with a balancing responsible. The latter solution today is limited to the three distribution companies.

5.1 Demand

Aggregate demand for electricity in Slovakia was 28,9 TWh in 2003. Domestic production added up to 31,1 TWh, and the country was a net exporter of 2,2 TWh. The size of the retail market (including transmission and distribution losses) was about 26 TWh in 2003. Retail customers can purchase directly from the dominant generator Slovenské Elektrarne (SE), import themselves or supplied by one of the 3 regional distribution and supply companies. After the shut down of two 440 MW reactors in Bohunice in 2006 and 2008, respectively, the

country is expected to become a net importer of electricity. Interconnections and imports will then play an even stronger role on the Slovak electricity market. (Juris, 2004).

5.1.1 Eligibility

The sequence of demand side electricity market opening in Slovakia is summarised in table 11.

Table 11. Eligible consumers in Slovakia

| Eligible consumers | Market opening in % | In effect |
|--------------------------------------|----------------------------|------------------|
| Consumers > 100 GWh/y | 35 | January 1, 2002 |
| Consumers > 40 GWh/y | 37 | January 1, 2003 |
| Consumers > 20 GWh/y | 41 | January 1, 2004 |
| All consumers, except for households | 72 | January 1, 2005 |
| All consumers | 100 | July 1, 2007 |

In addition to large consumers, all of the three regional distribution companies are eligible customers without restriction.

A peculiar feature of the present regulatory environment is that the Act on Energy (70/1998) still contains a section on the single buyer and does not mention traders as market participants. No license for a single trader has been issued to date (Kotiers, 2004). The market model thus has a wholesale competition character.

5.1.2 The size of the independent retail market

For 2003 we estimated the magnitude of the retail market independent from SE sales to add up to 4,6 TWh, that is 18% of total retail purchases. While the economy as a whole and also SE is a significant net exporter of electricity, the independent segment turned out to be a net importer of 1,3 TWh. (about 30% of independent retail purchases). This latter figure indicates the scope for import competition on the really competitive part of the Slovakian electricity market.

Anecdotic evidence suggests that only a few eligible customer changed its supplier in Slovakia. Note, however, that the size of the independent retail segment is much larger than the aggregate consumption of these consumers. This is made possible by providing the eligible status for the regional distribution and supply companies.

5.2 Price regulation for access and for the captive market

According to the Act on Network Industries, the Regulatory Authority (URSO) has the power to set the prices of the following activities:

- Generation in excess of 5TWh/annum (in practice, the incumbent operator SE)
- Provision of balancing and ancillary services for the System Operator (in practice, SE only)
- Transmission of electricity and system charges (charged by the System Operator)
- Supply of electricity to non-eligible customers

- Distribution charges for eligible customers
- System charges to distribution system users
- ‘Feed in’ tariffs for renewable energy and CHP

Entry and exit into / from the captive market is relatively easy in Slovakia. Thus, a price competition between the administratively priced captive segment and the market priced free segment exists.

Although transparent and cost reflective network access pricing is provided by the independent regulator URSO, there are some elements in the pricing regime that object competition (Kotiers, 2004).

Notably, administrative fees for balancing and ancillary services are relatively high. Since traders are not yet active in Slovakia, the risk management services that are provided by traders and balancing circles on other CEE markets⁹ are not yet available for market customers in Slovakia. This adds to the relative price disadvantage of the free market segment.

5.3 Supply

The supply side of the Slovak market is heavily concentrated. Main fuel types include nuclear (57,1%), fossil fuels (30,8%) and hydro (12,1%). While there are at least 5 generation plants with larger than 100 MW installed capacity, the rest of these plants belong to the same state owned generation company, SE. At the same time the country is well interconnected to most of its neighbours. Cross border capacity totals 3500 MW, which is equivalent to 44% of installed generation capacity. From this capacity the use of 1200 MW is reserved under long-term transit agreements (Juris, 2004).

5.3.1 The dominant player

SE is clearly the dominant player of the Slovak market. The >80% figures in table ... indicate this dominance in all the different segments of the industry: capacity, generation and wholesale. Beyond SE generators, captive generation plants, small hydro and CHP plants add 1GW to SE assets.

Table 12.

| Market segments | Share of SE | Figures for SE | Figures for Independent |
|---|--------------------|-----------------------|--------------------------------|
| Installed capacity | 87% | 6881 MW | 1074 MW |
| Domestic production | 84% | 26047 GWh | 5100 GWh |
| Wholesale purchases from domestic producers | 88% | 27527 GWh | |
| Sales for domestic retailers | 82% | 21377 GWh | 3248 GWh |
| Net exports | | 3574 GWh | -1319 GWh |

Source: own estimates

⁹ Note, for example, that the bulk of daily OTC trade in Hungary aims at smoothing the profiles of relatively large balancing circles in order to avoid paying relatively high balancing energy prices. As a result, the share of balancing energy in total electricity consumption is negligible in Hungary.

In addition, to date SE is the sole provider of balancing energy and ancillary services to the TSO, since this was the only provider of ancillary services meeting the technical requirements defined in the Slovakian Grid Code (SE Annual Report, 2003). The prices of these services are administratively set by URSO.

5.3.2 Cross border trade

In 2003 SE exported 8,6 TWh of electricity, from which 3,6 TWh was coming from own production, but the majority came from re-exporting imports of 5 TWh mostly from the Czech Republic, Poland and Ukraine. Export markets for SE are Hungary, Germany, Austria, Croatia, and Romania (SE Annual Report, 2003).

5.4 Wholesale market

Slovakia's electricity market consists mainly of bilateral trade between SE, distributors and eligible customers. No organized wholesale market exists in the country.

Dominant price leadership seems to be a characterisation that most closely describe the Slovak wholesale electricity market, although the dominant player is constrained in its ability to set the prices – it is the duty of the regulator. Independent purchases of customers and distribution companies both from domestic and import sources comprise the competitive fringe of this market. The lack of price transparency and liquidity are major features of the free market segment.

6 SLOVENIA

In Slovenia the market opening was remarkably fast, stipulated by the Energy Act of 1999. In the next two years the most important institutions were set up. From January 1, 2003 a partial market opening took place for 65 percent of consumption.

6.1 Demand

Aggregate demand was 11,8 TWh in 2003. Domestic gross production was 12,5 TWh in this year, thus Slovenia was a net exporter of electricity.

6.1.1 Eligibility

In Slovenia, since January 1, 2003, all consumers with higher than 41 KW connected capacity at one point are eligible customers. There are other eligible customers as well, those customers which are directly connected to the high-voltage or the middle voltage networks. These customers made up 67.8 % of the demand in 2003, and the number of them was 1% of all customers in Slovenia. From July 1, 2004 all non-residential customers are eligible, which means about 75% of the demand. Most of the trade was realized by bilateral contracts. Most of the eligible customers did not change their supplier.

6.2 Price regulation for access and for the captive market

There is third party access for the network. Theoretically the capacities are allocated according to first-come first served basis, but as there were no congestions on the domestic market, every actor could use the network at any time.

The network charges and the price of ancillary services are defined by the independent regulator, the Energy Agency. The prices are regulated according to a price cap, with a regulatory period of three years, which began at January 1, 2003. The network tariffs were intended to cover costs of distribution, the costs of the independent regulator and the electricity market as well. As the network tariffs were very low, a substantial increase of 15%/year was planned.

The prices for the captive market are regulated by the minister. Because of political pressure, the government was reluctant to increase retail prices in a sufficient magnitude, which led to a very small markup for the network operator.

6.3 Supply

There are 8 large power plants, which are legally separated. The concentration of ownership is very high in Slovenia. In table 13 we summarize the ownership structure of the actors in producing and distributing energy:

Table 13. Ownership structure of the Slovenian electricity industry

| | The Republic of Slovenia | HSE | Other share-holders | The municipality of Ljubljana | ELES GEN | The electricity industry of Croatia |
|---|--------------------------|------|---------------------|-------------------------------|----------|-------------------------------------|
| Holding Slovenske elektrarne, d. o. o. | 100.0 | | | | | |
| Drava Power Stations, Maribor, d. o. o. | 0.1 | 99.9 | | | | |
| Sava Power Stations, Ljubljana, d. o. o. | | 79.5 | 20.5 | | | |
| Soča Power Stations, Nova Gorica, d. o. o. | | 79.5 | 20.5 | | | |
| Thermoelectric Power Station Brestanica, d. o. o. | | 79.5 | 20.5 | | | |
| Thermoelectric Power Station Šoštanj, d. o. o. | | 79.5 | 20.5 | | | |
| Thermoelectric Power Station Trbovlje, d. o. o. | 77.1 | | 22.9 | | | |
| Combined Heat-and-Power Station Ljubljana, d. o. o. | 64.6 | | | 35.4 | | |
| Nuclear Power Station, Krško, d. o. o. | | | | | 50.0 | 50.0 |
| Elektro Celje, d. d. | 79.5 | | 20.5 | | | |
| Elektro Primorska, d. d. | 79.5 | | 20.5 | | | |
| Elektro Gorenjska, d. d. | 79.5 | | 20.5 | | | |
| Elektro Ljubljana, d. d. | 79.5 | | 20.5 | | | |
| Elektro Maribor, d. d. | 79.5 | | 20.5 | | | |
| Elektro-Slovenija, d. o. o. | 100.0 | | | | | |
| Coalmine, Velenje, d. d. | | 77.7 | 22.3 | | | |
| Coalmine, Trbovlje-Hrastnik, d. o. o. | 100.0 | | | | | |

Table 6: Ownership structure..... Source: Companies' data

Source: Annual Report of the AERS (2004)

On the producer side, the main actor is the Holding Slovenske Elektrarne (HSE), which is a fully state-owned enterprise. The major hydro and thermal plants are owned by this holding,

which produces 50.6% of electricity in Slovenia. The second largest player, owned by the transmission company, Elektro-Slovenia, is the Nuclear Power Station, which produces 40.6% of the total electricity production of the country. This power plant is situated near the Croatian border, and jointly owned by Slovenia and Croatia. According to a contract, 50% of the production of this power plant is transferred to Croatia. This contract is not necessary advantageous for Slovenia. Because of this the country is a net exporter, but it has to use more costly capacities for domestic consumption. The other generating companies are very small compared to these large producers.

As it is clear from the table, all large generating capacities are in state ownership. The share of other producers (small plants, co-production) make up only 3% of total electricity consumption. Consequently one cannot expect competition among firms within the country, only from imports.

We can see that other participants of the Slovenian electricity market are also in state ownership. The system operator, Electro-Slovenia (Eles) is state-owned, and one of its affiliates owns the 50% of the Nuclear Power Plant. Even more strange, ELES owns one of the largest firms of the country, TALUM, which is an aluminium producer, and BORZEN, the electricity market operator. The majority of all 5 distribution companies are owned by the state as well.

In theory the wholesale prices are not regulated. Nevertheless, an obligatory feed-in system exists for supporting small producers and environment-friendly producers. This scheme is available for 11.2% of generation. The cost of this is covered from the network charges.

To conclude, in Slovenia the market structure is very concentrated even compared to other CEE countries. As more than 97% of all capacities is owned by the state, there will be no real competition without the close integration of the country, as there is effectively no competitive fringe.

6.4 Cross border trade

As it was mentioned before, the cross border capacities can play a major role in the Slovenian competition as the concentration of the local market is very high. Import capacity (NTC) is 1,6 GW which is 53% of installed generating capacity of the country (EU Commission, 2004, p.17).

Since January 1, 2003 Slovenia is a member of the European unified electricity market. The country has cross-border connections with Croatia, Austria and Italy. To Croatia, the capacity constraints are not binding. The allocation of these capacities was based on bids, but partly on non-market criterion, "pro-rata", which is a proportional system. This naturally hinders competition strongly. On the Slovenian-Austrian border, 130 MW of export capacity was tendered (for free of charge) and 110 MW for import. To Italy, 190 MW of export capacity was tendered. The export capacity to Italy is more important as energy prices are higher in Italy, then in Austria and Germany. The total peak capacity of Slovenia was 2,785 MW in 2003. During these tenders 16 eligible customers and 5 electricity producers gained access to cross-border capacities.

In 2003, the import was not an effective constraint on the prices in Slovenia, as market prices were 31% above the level in Germany on average.

6.5 Market trading

There is an organized market for electricity, operated by BORZEN, which is owned by the network operator. The market mainly means a daily spot market. There is even an index, SLOeX. In 2003 3.1 % of consumed electricity was traded on this market. Unfortunately as the supply is very concentrated, the market is very thin, thus the EX price can not be considered as representative for the price of electricity in Slovenia.

7 BARRIERS TO EFFICIENT COMPETITION AT THE NATIONAL LEVEL

In this part of the paper I start to sum up the lessons that emerge from the individual national experiences and to point to developments that are favourable or disadvantageous for increased wholesale competition both at the national and the regional level. First I concentrate on the local level and then list issues of regional significance.

7.1 Market structure

Electricity market liberalization at the European level, both in its talk and legislative efforts, puts disproportionately large emphasis on the demand side of the market and an insufficient or negligible emphasis on the supply side issues of the emerging market. Beyond the requirements for a legal unbundling of the network operators from generation and trading branches, it is silent on the generation and wholesale conditions necessary for inducing efficient competition. Not to talk about the cross-integration of the electricity and gas markets. As long as one thinks of an unconstrained and levelled competition at a European level, this might not cause much problem in the short run. But the implications of this weakness of the European legislation on the emerging local market structures, at least in CEE, are dominant.

The emerging market structure in the CENTREL countries and Slovenia is a one dominated by a single wholesaler (Dominant wholesaler, DW) and a competitive fringe. Massive state ownership of domestic generation (Slovakia, Czech Republic), long term PPAs (Poland) or both (Hungary) provide the excessive purchasing position for the wholesaler. Given its large portfolio, the DW can often offer favourable conditions for independent producers and purchases a large share of their production. Long term foreign trade related PPAs, through decreasing available CBT capacity for the fringe and through ensuring stable additional purchase / sales options for the DW adds to the market power it has. On the sales side, the exclusive (Hungary) or the dominant (Poland, Czech Republic) right provided to serve administratively priced (tariff) consumers (captive plus remaining eligible) directly and/or through retailers and their preferential right of access to interconnections (PPAs) creates the basis for dominance. The share of purchasing electricity from domestic producers is 88% for CEZ, 89% for MVM, 88% for SE and minimum 65% for PSE.

The structure of the purchasing side of the DW as it was described above creates an additional major, but perhaps less apparent market (power) problem. Both property rights and the typical

PPA delegates the right to schedule the production of available slack capacity to the DW. Thus the DW has both the right to purchase from the generators and the right *not* to allow others to purchase from the generators in question. This is a major sales restriction even for unbundled, private and ‘independent’ power producers (‘I’PP).

An additional piece of bad news for the development of competition is the way renewable and CHP support schemes are structured on the CENTREL markets. The mean to promote green and CHP generation is the obligatory feed in system that channels such production into the purchase portfolio of the DW. These schemes decrease available electricity for the free segment by 3% in Poland and by 4,5% in Hungary.

We can also find examples for provisions that restrict the group of suppliers that can provide for the network losses on the local market (e.g. in Hungary). The significance of such provisions is apparent if we add that the average rate of losses is still around 10% of gross consumption in these countries.

The above characteristic of the wholesale level market structure might explain one of the surprising findings of the country reviews. Namely, that the competitive fringe in each of the countries is a massive importer, even in those major net exporting countries like Slovakia or the Czech Republic. It seems that the DW, by using its right to command the slack in generation, creates a shortage in domestic supply for those serving the competitive fringe.

7.2 Competition for tariff consumers

I call tariff consumers all those electricity consumers who purchase electricity at an administrative retail price (including access prices) set by a regulatory commission or a minister. Tariff consumers make up the administrative segment of the retail market (AM). The rest is called as the competitive segment (CM). Captive consumers are tariff consumers by definition. For an eligible consumer who is at the same time a tariff consumer, there are two preconditions for being in this category. First, he or she has to have the right to purchase at the administrative retail price. Second, he/she has to decide to do so instead of purchasing at a competitive retail price. As demand side liberalization proceeds, the importance of the second category increases. From July 1, 2007, we do not have to count with captive but only with tariff consumers. From this point of time the concept of ‘eligible’ consumer as we use it today should be redefined by saying that an eligible consumer is someone who has the right to purchase electricity at an administratively set price.

The electricity Directive foresees this transition in a quite vague way. While ‘vulnerable consumers’ might be provided by electricity at an administratively set ‘last resort’ tariff, there seems to be no explicit constrain on who else might also be eligible for the status of a tariff consumer after July, 2007.

On the CENTREL markets, the natural domestic sales basis for the DW is the AM and for the competitive fringe is the CM. In some countries, like Hungary, the DW is granted an exclusive right to serve the electricity needs of the AM. In Slovakia, the proportion of free purchasing possibilities of the distribution companies are linked to the consumption of eligible consumers in their service territory. In the Czech Republic and Poland, the ownership of the majority of distribution companies by the DW supports this sales basis.

Figure 16 depicts a scheme of a local wholesale electricity market that tries to sum up and illustrate what I have discussed in the foregoing about the supply and demand side characteristics of this market.

As liberalization proceeds, the room for competition for eligible consumers increases. If eligible consumers lost their right to purchase electricity at an administratively set price, the nature of competition on the CENTREL markets could fit a dominant price leadership model. However, until eligible consumers have the right to choose from the administrative and the competitive price, and this is a low cost choice, a strange competition between the administratively priced and the market priced segments develops. Under such conditions the DW tends to make the supply for the free segment as short as it can. A consequence might be that the free market price will converge to the administratively set price.

Finally I note that some unnecessary purchase restrictions on e.g. regional distribution companies (Hungary) or on the CBT activities of traders (Poland) further restrict the scope for fair competition on domestic electricity markets in the region. Weak (Poland, Czech Republic, Slovenia) or missing (Hungary, Slovakia) organised electricity exchanges and the consequent lack of transparency of transactions at the wholesale level adds to these problems.

8 CONCLUSION - THE PERSPECTIVE FOR REGIONAL MARKET INTEGRATION

Based on the foregoing discussion, I argue that after a few years of introducing TPA regimes in the investigated new member states, the emerging domestic electricity market structures exhibit some common features. First, the new structure is stuck between two consistent systems. These markets are not yet vertically integrated ones, neither are sufficiently competitive. Second, the level of wholesale market concentration is exceptional: no such a level of concentration in other industrial sectors would easily be tolerated by national antitrust authorities. Third, under the prevailing market structure the scope for the emergence of alternative wholesalers with a large-enough consumer portfolio is strictly restricted. In case this is a durable situation, new IPP investors will be forced to contract with the dominant incumbents, thus reinforcing the present market structure.

I think a deeper regional integration of some markets in Central and Eastern Europe could be a way out of this world of small, segmented and distorted local markets.

The technical preconditions for a deeper market integration seems to exist, given that the ratio of import capacity to installed capacity for these countries are among the highest in Europe. The finding, that local competitive market fringes are massive importers even in large exporting countries indicates the outstanding importance CBT might and can play in further market integration in the region.

I have to note that there is a positive trend in developing schemes that fit market principles for the allocation of congested interconnection capacities in the region. The Czech Republic set up explicit auctions with all of her neighbours for this aim. Slovakia and Hungary are on the same track. A coordinated auction system has been just started between Hungary and Austria. The TSOs of Austria, the Czech Republic, Hungary and Slovakia teamed up for a joint project to establish a coordinated auction of cross border capacities they control.

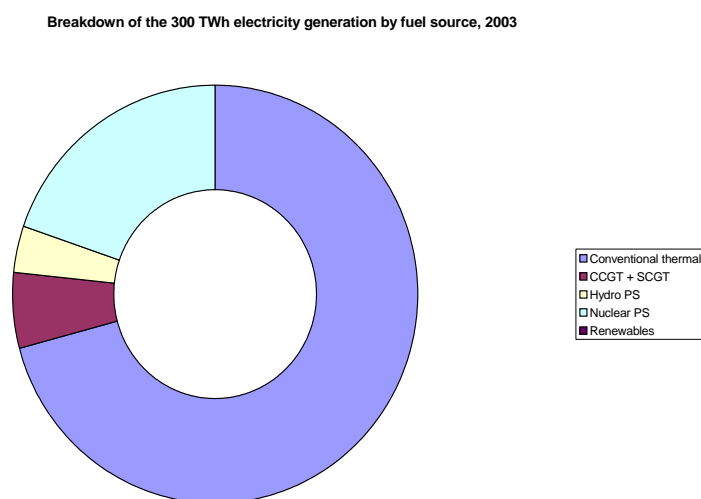
The rationales for such a development and integration are apparent. A larger market with harmonized market rules could provide for a significant gain in the efficiency the national systems are operated. A larger integrated market could also enhance (private) investment opportunities in generation and also the network. Increased investment, in turn, would mean an increased security of supply.

Also, a dominant incumbent wholesaler in a domestic market context can be a small or middle sized market player on a regional or European level. Perhaps with the exception of CEZ, the size of CENTREL incumbents are negligible when compared to the group of the ‘seven brothers’ (Thomas, 2003), that is major European energy companies. It is an open question for future research what effects an oligopolistic competition on a more integrated CEE electricity market would have on the performance of local dominant wholesalers and regional electricity prices.

Finally, it is important to note that despite the numerous rationales for market integration, there are major obstacles to such a development in the region. The most apparent are the vested interests of the local dominant wholesalers, which were endangered by an increased competition on their local markets. Their performance is supported by long term CBT PPAs that are substantially reducing ATC at the borders; by the indirect subsidisation reflected in moderate or non-existing profit expectations from the state owner; and the priority these players enjoy in assessing the production of low marginal cost local nuclear producers. Without political will, these obstacles will hardly be removed from the way to a competitive electricity market in the region.

Tables and Figures

Figure 1. Fuel basis for electricity generation for the five countries, 2003



Source: VESTÉK, 2003 for Hungary, CENTREL homepage, CEZ homepage, Annual Report (2003) of the Slovenian energy regulator

Table 1. The fuel base for electricity generation in the five countries, 2003

| | Czech | % | Hungary | % | Poland | % | Slovakia | % | Slovenia | % | Total | % |
|--|-------|-----|---------|-----|--------|-----|----------|-----|----------|-----|--------|-----|
| Total electricity generation, GWh | 83227 | | 34145 | | 138840 | | 28900 | | 12491 | | 297603 | |
| Conventional thermal | 53046 | 64% | 10894 | 32% | 133010 | 96% | 8900 | 31% | 4551 | 36% | 210403 | 71% |
| CCGT + SCGT | 2511 | 3% | 11987 | 35% | 2720 | 2% | 0 | 0% | 173 | 1% | 17391 | 6% |
| Hydro PS | 1794 | 2% | 171 | 1% | 3110 | 2% | 3500 | 12% | 2650 | 21% | 11225 | 4% |
| Nuclear PS | 25872 | 31% | 11013 | 32% | 0 | 0% | 16500 | 57% | 4957 | 40% | 58343 | 20% |
| Renewables | 4 | 0% | 80 | 0% | 0,3 | 0% | 0 | 0% | 160 | 1% | 244 | 0% |

Table 2. Physical, business and legal integration of CEE electricity markets, 2003

| Country | Introduction of rTPA (first step %) | Physical integration | CBT/ EISO agreement | Restriction on imports | Surplus Capacity, MW* | Net exports, Gwh | Private participation |
|-----------------|--|-------------------------|------------------------|---|--------------------------|---------------------|--|
| Czech Republic | 2002, 33% | UCTE | Jan. 2003 | n.a. | 5196 | 16200 | 30% of CEZ privatized |
| Hungary | 2003, 35% | UCTE | April 2004 | Only physical | 2540 | -6939 | Generation: 36%, Distribution: 87% private |
| Poland | 1998, 47% | UCTE | July 2004 | 30% of eligible consumption is allowed | 10344 | 10170 | 20% of generation private, distcos under bidding |
| Slovak Republic | 2002, 35% | UCTE | April 2004 | 2003: 66%, 2004: 33%, 2005: 0% | 3970 | 2255 | 49% of distribution is private, 66% of SE is offered for private investors |
| Slovenia | 2001, 65% | UCTE | Jan. 2003 | No restrictions from Jan. 2003 | n.a. | -151 | insignificant |

* Source: ERRA homepage (www.erranet.org), 2002 data, homepages of regulators, own collection.

Table 3. Key figures for the four CENTREL countries

| CENTREL Key Figures 2003 | |
|---------------------------------|-----------|
| Maximum net generating capacity | 63,976 MW |
| Net electricity production | 275.9 TWh |
| Net electricity consumption | 228.3 TWh |
| Import (+) / Export (-) balance | -21.7 TWh |

Source: CENTREL homepage, www.centrel.org

Figure 2. The Power system of CENTREL as part of UCTE

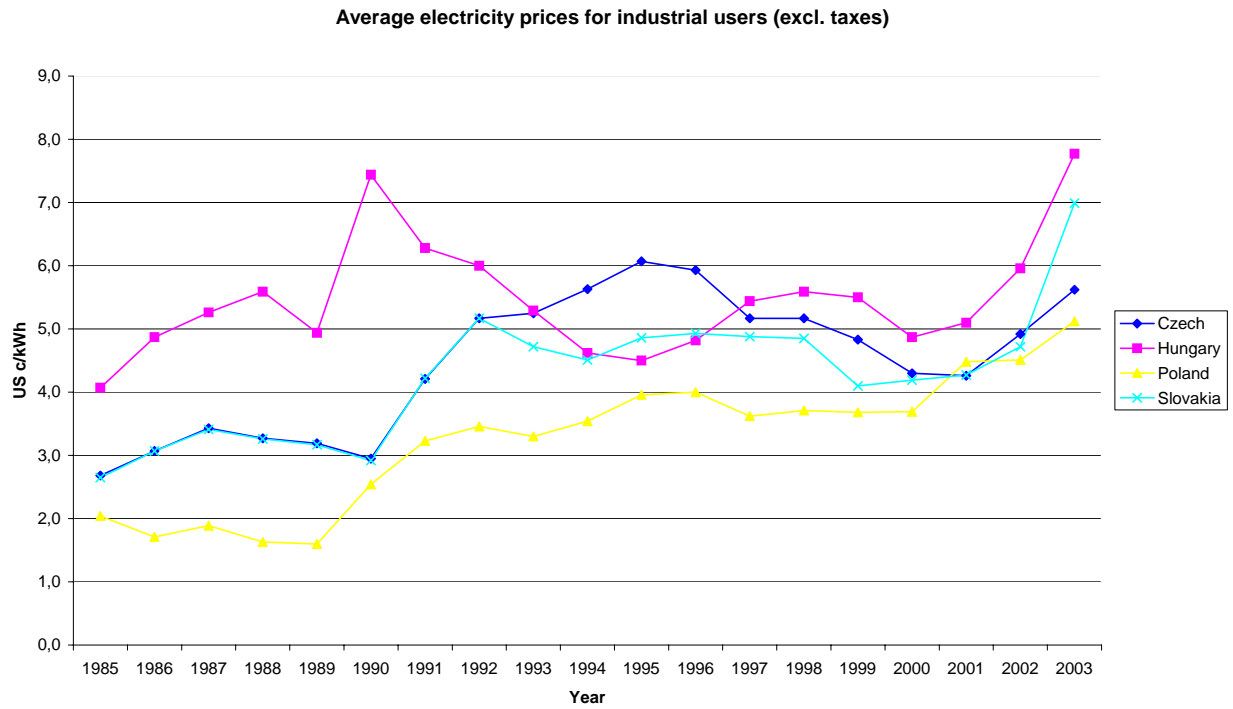


Table 4. The concentration of the generation market in CENTREL

| | Number of generator companies with installed capacity above | | Number of generator companies, which are producing significant share of electricity | |
|------------|---|--------|---|------|
| | 50 MW | 100 MW | 50% | 75% |
| Czech Rep. | 26 | 11 | 1 | 2 |
| Hungary | 12 | 10 | 2 | 4 |
| Slovakia | 6 | 5 | 1 | 1 |
| Poland | 54 | 39 | 4 | 8 |
| | | | | |
| Estonia | 1 | 1 | 1 | 1 |
| Latvia | 1 | 1 | 1 | 1 |
| Lithuania | 6 | 5 | 1 | 1 |
| | | | | |
| Bulgaria | 14 | 9 | 3 | 10 |
| Romania | 7 | 6 | 2 | 2-3 |
| | | | | |
| Armenia | 5 | 5 | 2 | 3 |
| Albania | 1 | 1 | 1 | 1 |
| Georgia | 10 | 9 | 2 | 5 |
| Kazakhstan | n.a. | n.a. | n.a. | n.a. |

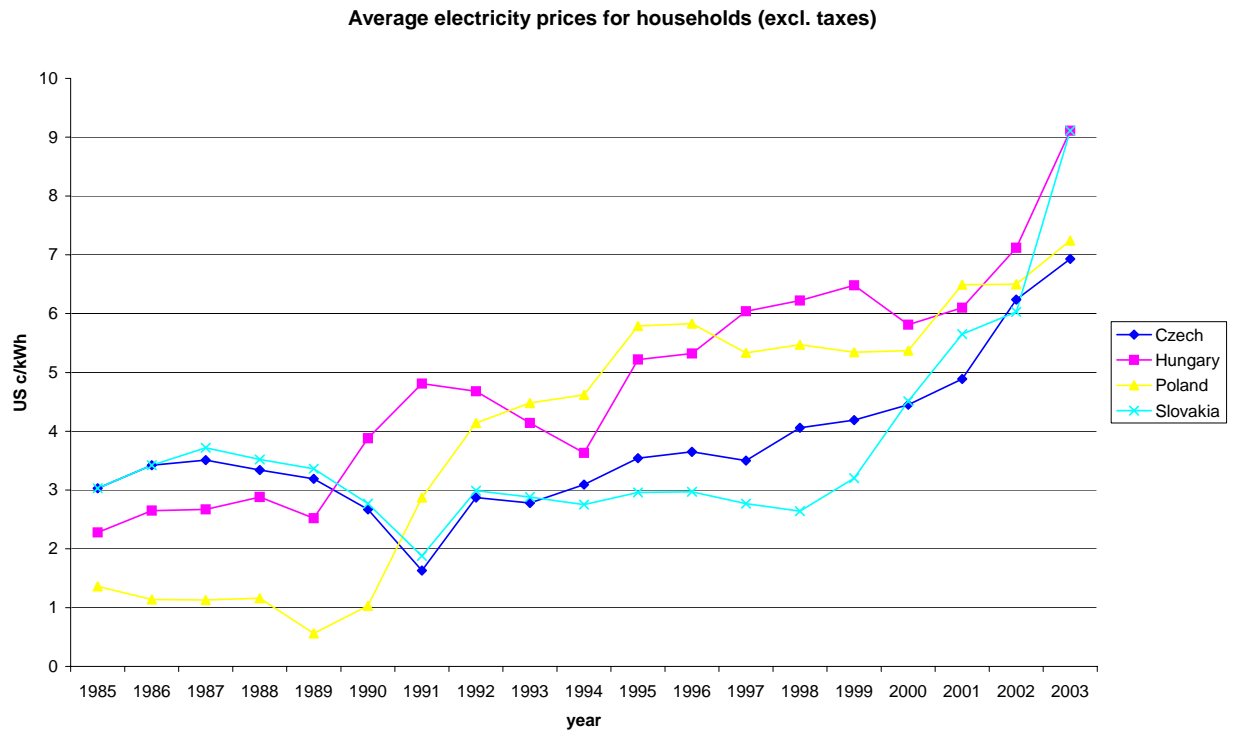
Source: Szörényi (2004)

Figure 3.



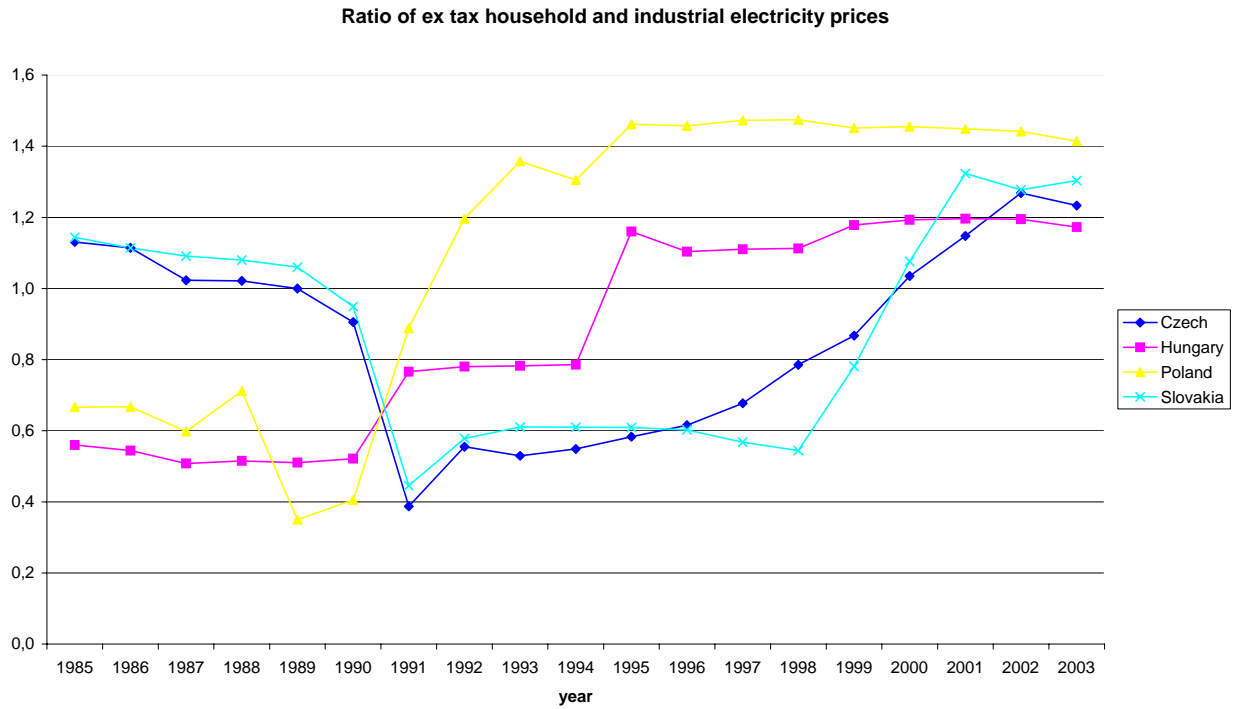
Source: IEA

Figure 4.



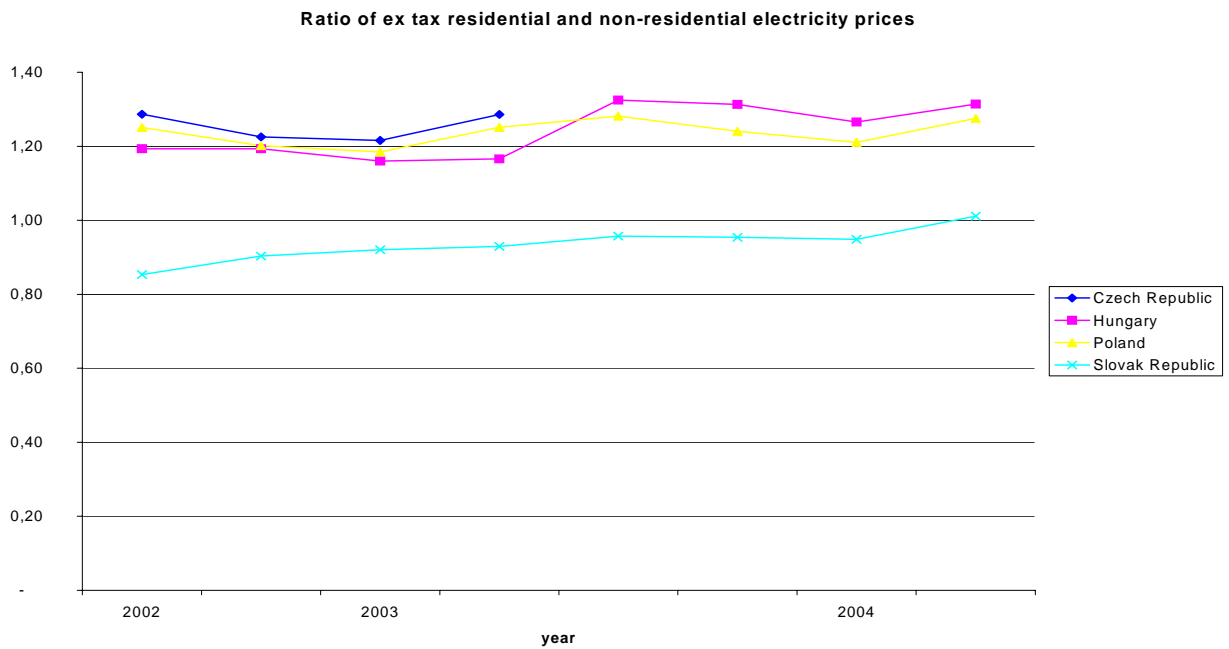
Source: IEA

Figure 5.



Source: IEA

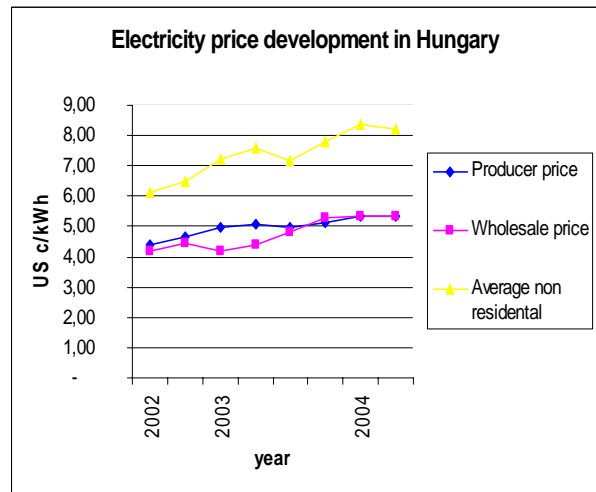
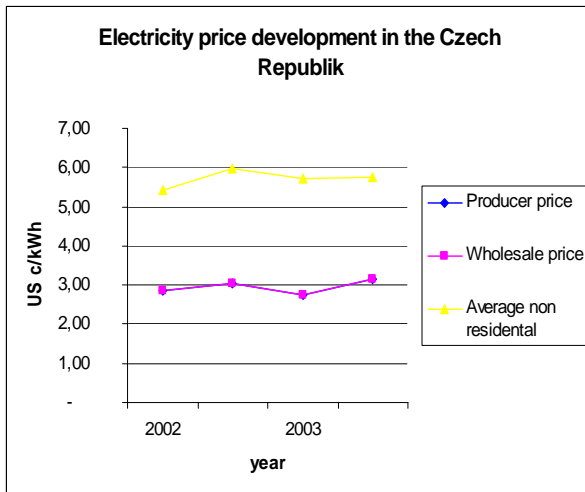
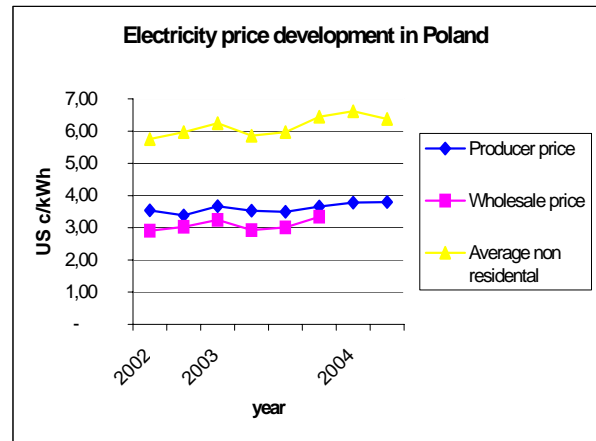
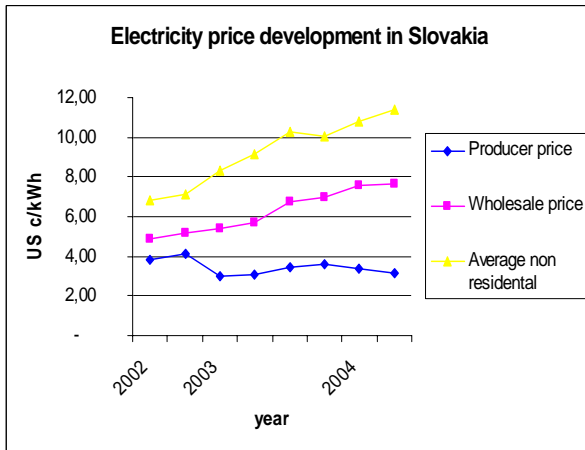
Figure 6.



Source: ERRA

Figures 7-10.

A comparison of CEE electricity markets



Source: ERRA

Figure 11. Average monthly baseload prices on the Leipzig, Austrian, Slovenian, Czech and Polish power exchanges, 2002

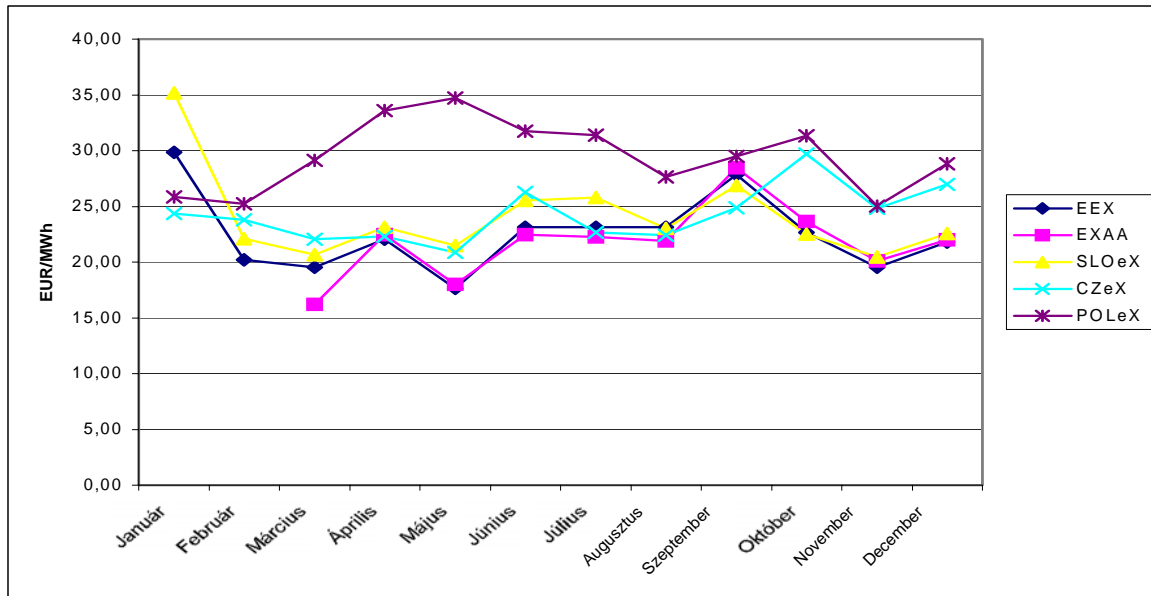


Figure ... Average monthly peak prices on the Leipzig, Austrian, Slovenian, Czech and Polish power exchanges, 2002

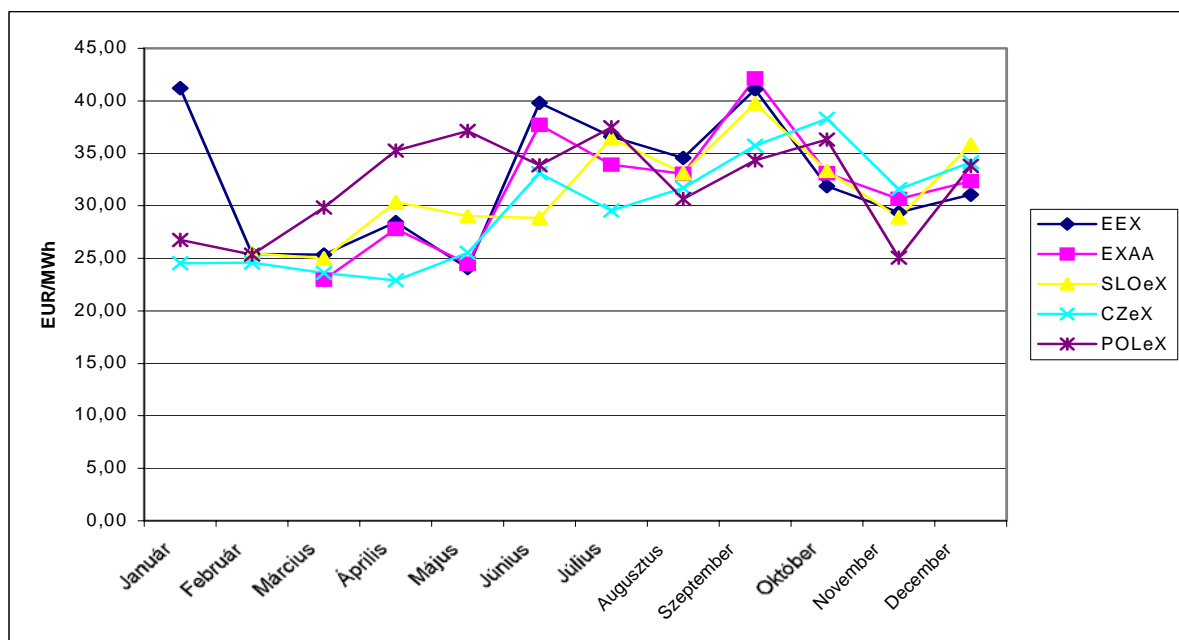


Table 5. Energy Regulatory Commissions / Authorities in CEE new member states

| | Year of establishment | Staff | Finances | | Type | | Term | | Price setting authority |
|------------------------|------------------------------|--------------|-----------------|--------------------|-------------------|-------------------|--------------|------------------|--------------------------------|
| | | | <i>Budget</i> | <i>Independent</i> | <i>Commission</i> | <i>Individual</i> | <i>Fixed</i> | <i>Undefined</i> | |
| Czech Republic | 2001 | 75 | X | | | X | 5 years | | YES |
| Hungary | 1994 | 90 | | X | | X | 6 years | | NO |
| Poland | 1997 | 257 | X | | | X | 5 years | | YES |
| Slovak Republic | 2001 | 50 | X | | 6 persons | | 6 years | | YES |
| Slovenia | 2000 | n.a. | | X | | X | X | | YES |

Table 8. The ownership of the Czech distribution companies

| Company | Region | Majority Owner |
|----------------------|------------------|-----------------------|
| Jihomoravská (JME) | Southern Moravia | (E.ON) |
| Severomoravská (SME) | Northern Moravia | CEZ |
| Severočeská (SCE) | Northern Bohemia | CEZ |
| Východočeská (VCE) | Eastern Bohemia | CEZ |
| Pražská (PRE) | Prague | |
| Středočeská (STE) | Central Bohemia | CEZ |
| Západočeská (ZCE) | Western Bohemia | CEZ |
| Jihoceska (JCE) | Southern Bohemia | (E.ON) |

Source: IEA (2001)

Figure 13. The major institutions of the Czech electricity market

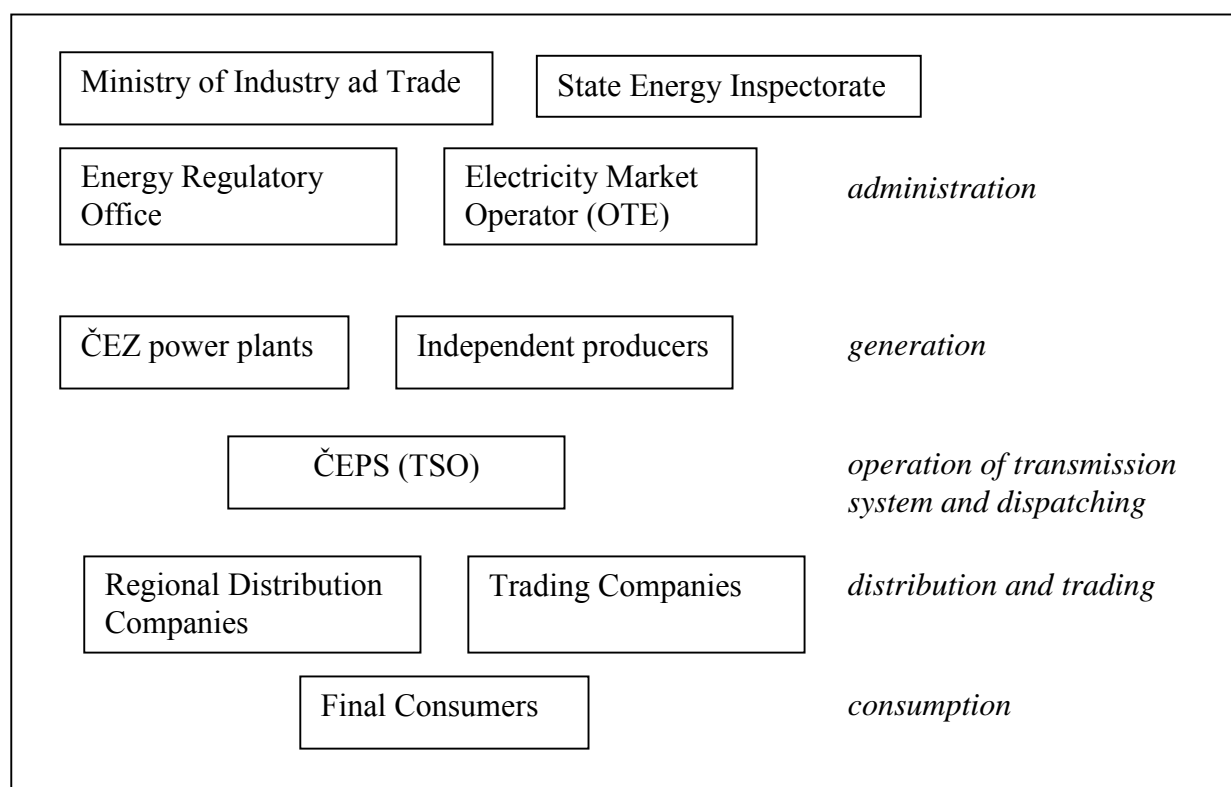
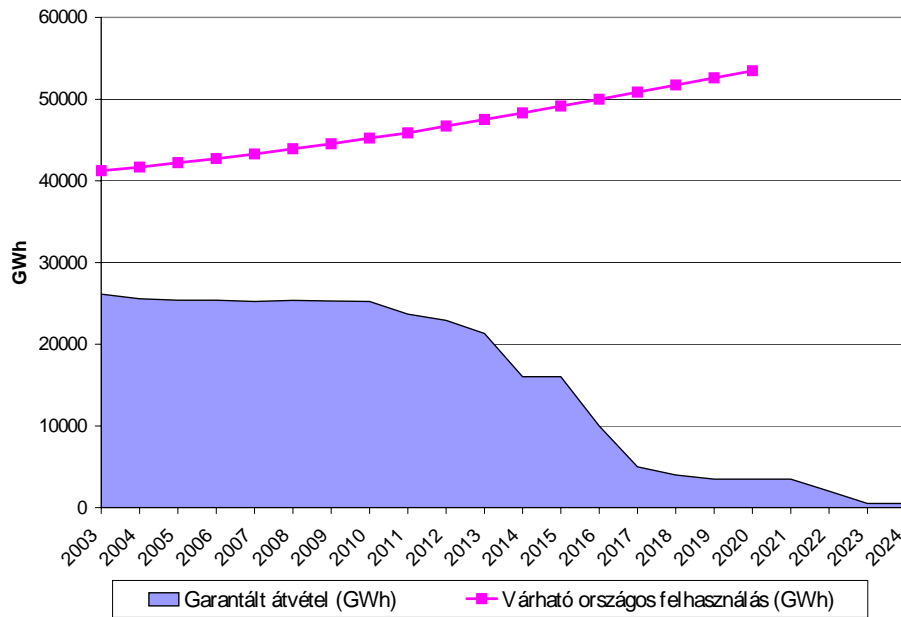


Figure 14. Projected gross consumption of electricity vs. guaranteed purchase of MVM Rt based on long term PPAs



Source: Horváth J. (2004)

Figure 15.

Market share of free market consumers on the Hungarian market (2003-04)

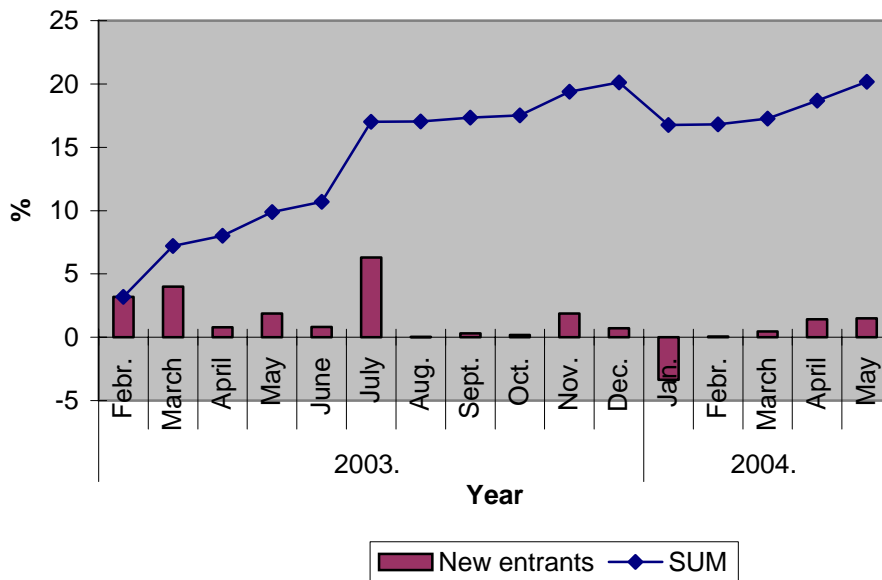
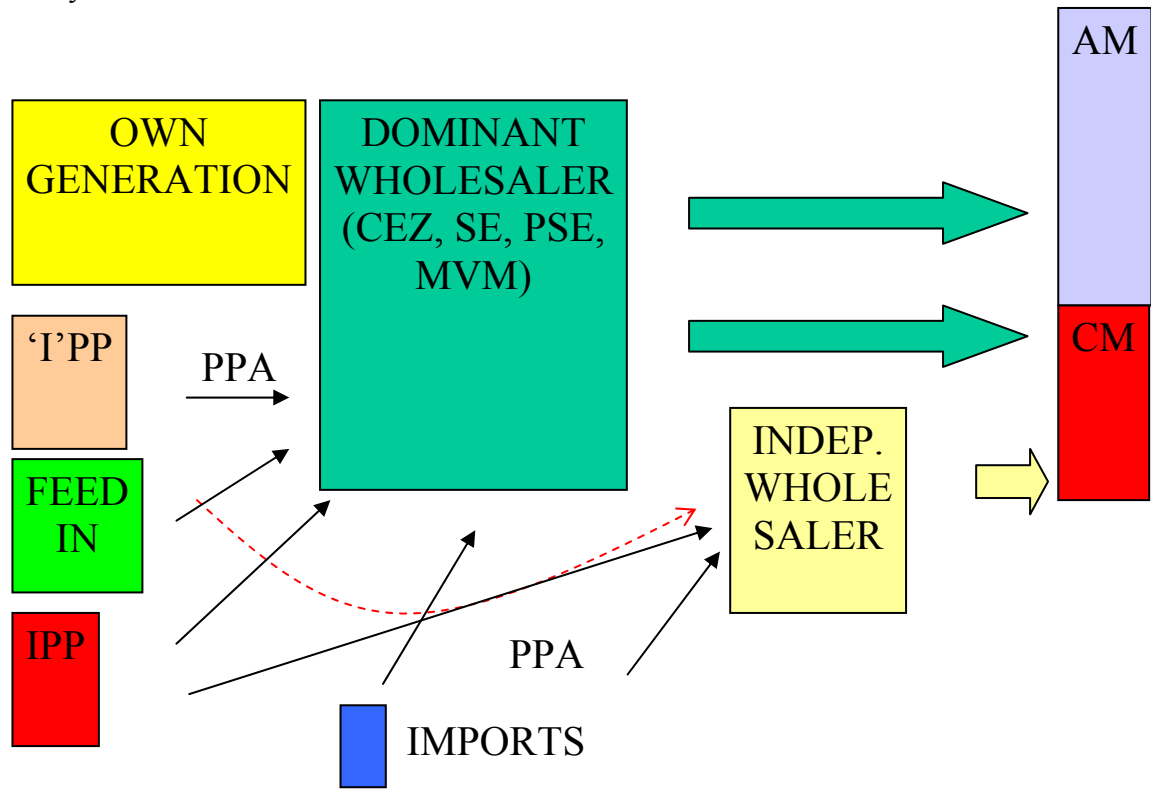


Figure 16. A schematic representation of wholesale market conditions on CENTREL Electricity markets



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