



International Center for Economic Growth
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The Expected Effects of the EU Accession on the Electricity Sector in the Czech Republic

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1. Electricity market in a broader context of energy sector

The electricity market in the Czech Republic should be viewed as a part of the energy sector. Therefore, before examining the features of the electricity market itself, let's look first at recent developments in the whole energy sector.

1.1. Energy sector

The development of the Czech energy policy and markets is considerably influenced by the previous period of central planning. The main problems inherited from half a century of central planning can be summarized as follows:

- high energy intensity
- concentration on few energy sources, coal-oriented economy connected with heavy environmental burden
- high industry share in the end-energy consumption, highly specialized industry (heavy engineering, energy intensive branches of basic industries)
- age and structure of power station facilities
- isolation from the international market, dependence on hydrocarbon imports from Russia
- no functioning energy markets, prices were heavily subsidized
- disregard for environmental objectives, lack of incentives for energy savings and buying more energy-efficient products

The transition period has brought some important changes. During the 1990s (1990-1999):

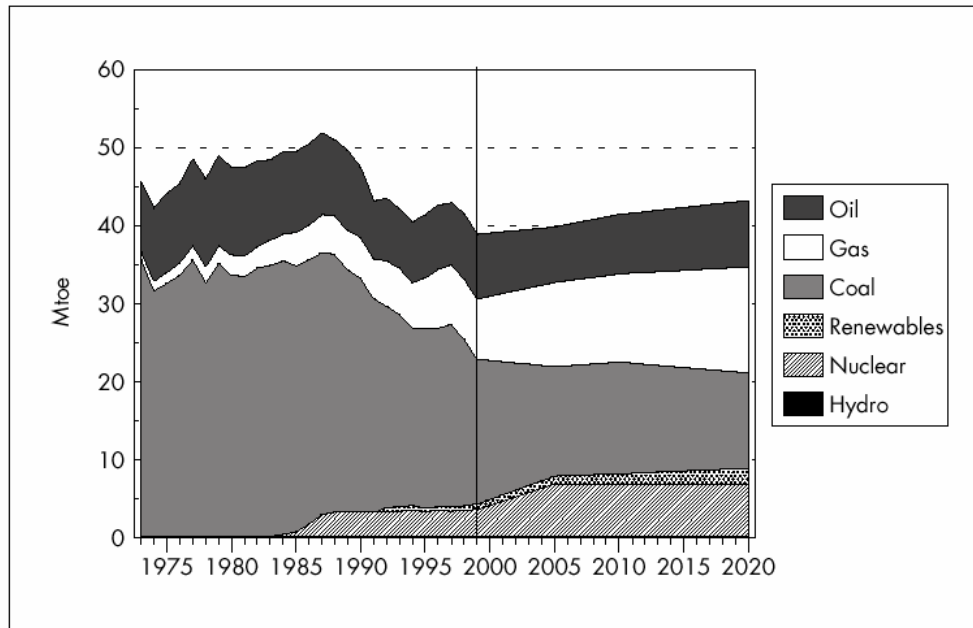
- **total primary energy supply** (TPES) has fallen by 19%; the Czech Republic has become less dependent on solid fuels because of the switch from brown coal to other fuels (esp. gas and nuclear energy, less oil) and the closure of coal power plants (see Table 1 and Figure 2).

Table 1. Total primary energy supply in 1990 and 2000, projection for 2010 (shares in %)

	1990	2000	2010
Coal	63	51,3	34,8
Oil	18,9	19,3	18,5
Natural gas	11,1	18,6	27,5
Nuclear	6,9	8,5	16,3
Renewables* ⁿ	0,1	2,3	2,9
Total (in million toe)	47,4	39,8	41,5

* includes hydropower, energy from waste
Sources: IEA/OECD, Deutsche Bank Research

Figure 1. Total primary energy supply 1973-2020



Source: Energy Policies of IEA Countries – Czech Republic 2001 Review, IEA, 2001

- the total **energy production** of the Czech Republic has decreased by 27%; while in 1990 domestic production covered about 80% of TPES, in 1999 it covered only 51% of TPES; despite a one-third decrease in absolute terms, coal remains the dominant factor in domestic production (85% in 1999)
- **energy imports** have increased by roughly 30% due to reorientation of the energy mix; the share of imports in TPES rose from 19 to 49% between 1990 and 1999, costs of energy imports (45% oil and 50% natural gas) accounted for 5% of GDP in 1999. Efforts have been made to diversify the geographic import portfolio and reduce the country's dependence on hydrocarbon imports from Russia, which represented 33% of TPES in 1998 (e.g. a 20-year contract on gas import from Norway signed in 1997).
- as for **energy exports**, the main article is hard coal (about 6 Mtoe in 2001) but its exports are in steady decline owing to lower demand and greater competition in the international market; electricity on the second place with a strong up-ward tendency (net exports in 2001 amounted to 0.86 Mtoe).
- **final consumption** has fallen by 30% 24.8 (Mtoe in 1999); the structure of consumption modified considerably: coal fell from 49.4% in 1990 to 14.4% in 1999, gas increased from 11.9% to 24.7%, and oil increased from 22.9% to 31.1%. As for consumption in sectors, the share in industry (46.2% in 1990) - despite decreasing tendency - is higher than the average for OECD Europe (30%), the share of transport doubled from 8.1% in 1990 to 16.5% in 1999 and the share of the residential and commercial sector has decreased only slightly, to 34%.

Figure 2. Final consumption of fuels and energy according to type of fuels

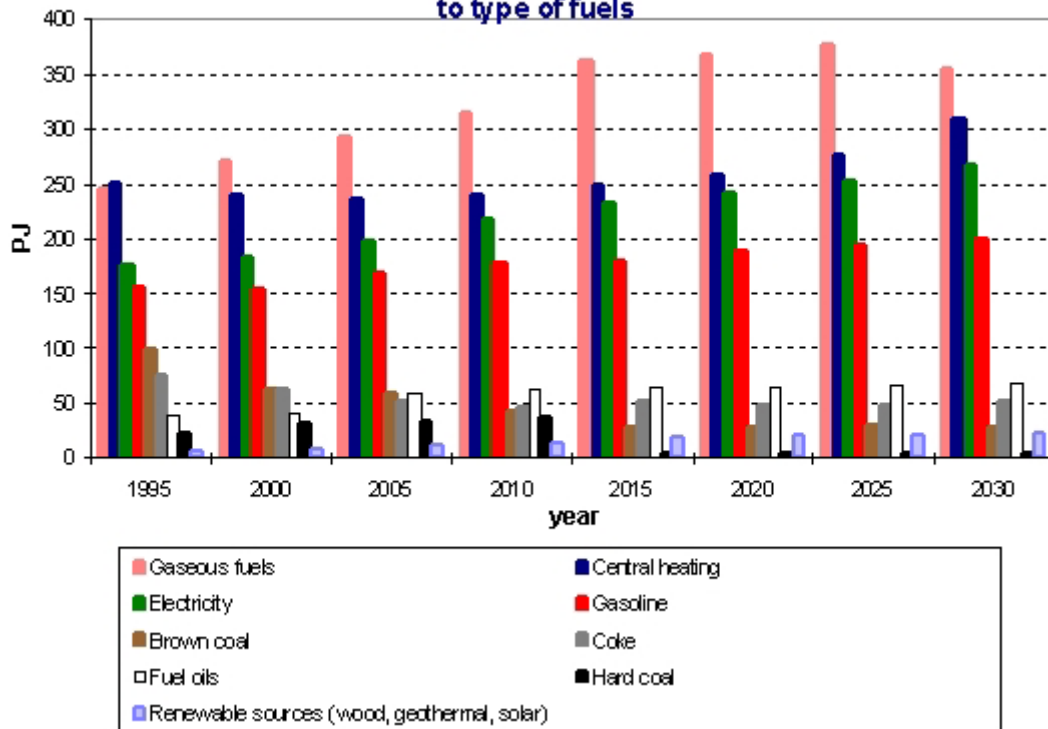
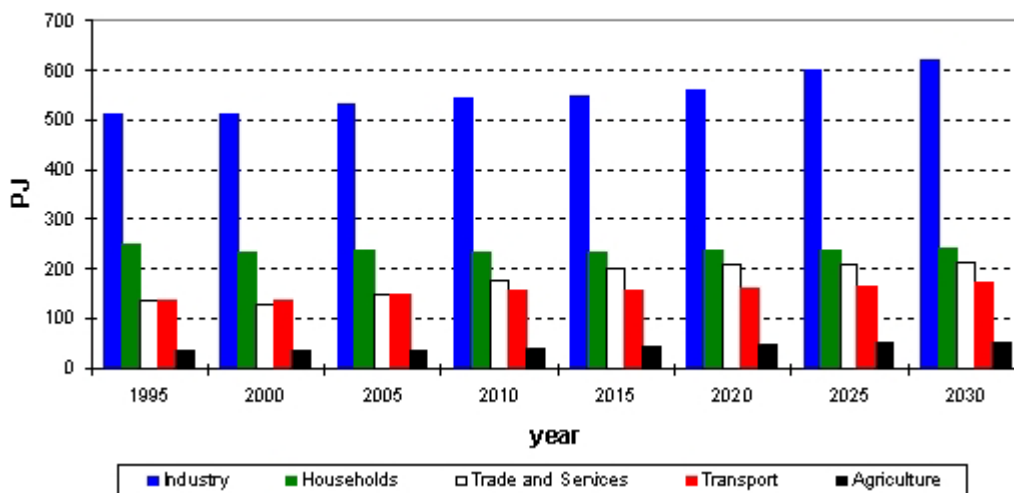


Figure 3. Final consumption of fuels and energy according to sectors

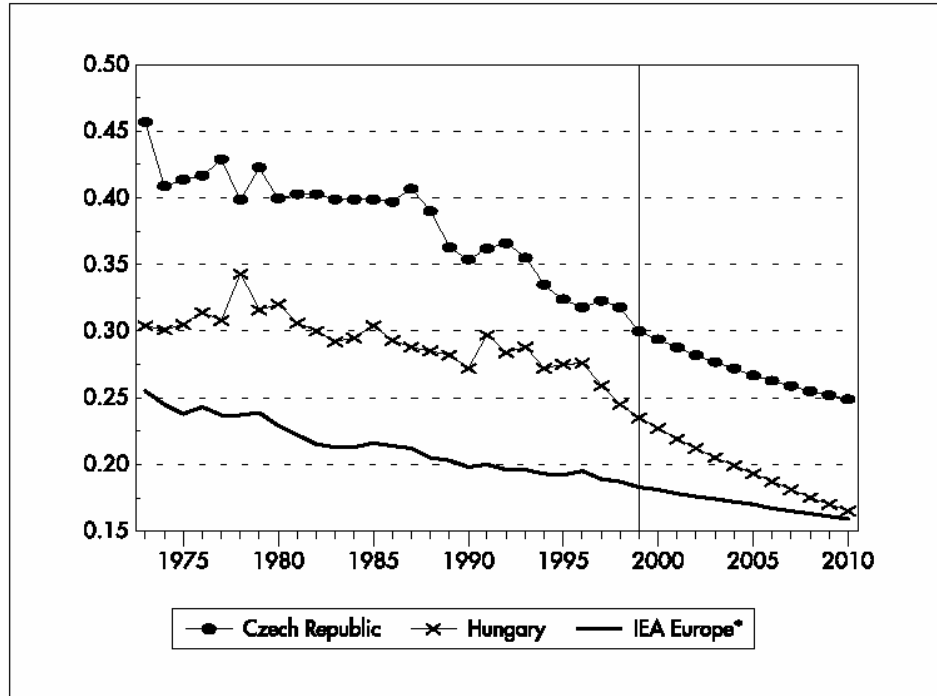


Source (Figure 2 and 3): Ministry of Industry and Trade

- **energy intensity** (TPES/GDP) decreased significantly between 1990 and 1998 (2.4% per year). Progress was made mainly in industry and in the private housing sector. On the other hand, the energy intensity rose noticeably in the transport sector mainly because there was a shift away from rail traffic to more energy-intensive road traffic. Current energy intensity of the Czech Republic is still some 60% higher than the EU average and some 25% higher than the energy intensity of Hungary (see Figure 4). According to other sources, energy efficiency is about twice lower in the Czech Republic than in the EU, comparable to Poland and higher than Slovakia.
- The main reasons for Czech Republic's high energy demand compared with the industrialized countries of IEA Europe are: a much lower GDP; higher reliance on solid fuels and a high share of

energy-intensive production processes (metallurgy, production of building materials, etc.); lower building and appliance standards; and low energy prices along with a lack of energy saving incentives.

Figure 4. Energy intensity in the Czech Republic and other IEA countries 1973-2010
(Toe per thousand USD at 1995 prices and purchasing power parities)



Source: Energy Policies of IEA Countries – Czech Republic 2001 Review, IEA, 2001

1.2. Energy policy and regulatory framework

Until 2000, the government's energy policy was based on the policy guidelines adopted in 1992 and 1994 Energy Act. The main aims of the policy were diversification of energy supply, i.e. reduction of coal use, through the development of nuclear energy and new hydrocarbon imports (long-term contracts with Norway and Russia), phasing-out of uncompetitive units, equipment of coal-fired power plants with long-term prospects of use with desulphurization and denitrification units, unbundling of distribution from generation, international cooperation (ratification of the Energy Charter in 1996 and membership in International Energy Agency in 2001).

However, these were only minor changes. In fact, the sector showed considerable inertia. Unlike Poland or Hungary, the Czech Republic's energy sector remained practically untouched by transformation for a decade: monopolies in electricity generation and transmission persisted, there was neither equal access nor possibility of choice for consumers, prices were strongly deformed, cross-subsidies and tariff distortions persisted, privatization of key energy companies was delayed, deformed energy prices, and obstacles to competition remained in force. Direct subsidies, indirect support and cross-subsidies amounted to an estimated CZK 206.7 billion during the period 1994-1998. It was only the perspective of the EU membership what gave the decisive impetus for liberalization.

In January 2000, a new "Energy Policy" paper was issued by the Ministry of Industry and Trade and approved by the government. It contained new objectives up to 2020, including the acquisition of reliable,

safe and environmentally acceptable energy supplies to support economic competitiveness, and opened the way for liberalization of the sector.

Using the Energy Policy paper as a basis, the government proposed a new **Energy Act**, which was adopted by the parliament in December 2000 (No. 458/2000) and came into effect in January 2001. The Energy Act, designed in view of accession to the European Union, includes provisions to:

- Create a transparent business environment for the energy sector by establishment of an independent regulator - **Energy Regulatory Office (ERU)**.
- Develop competition in the generation and retail-supply segments of the electricity and natural gas markets.

The government has also decided to adjust household electricity and natural gas tariffs progressively until the end of 2002 and thus remove cross-subsidies. Cross-subsidies have fallen significantly also owing to the application of full VAT. All energy for end use is subject to VAT at 22% except for heat supply and biomass fuel, for which the reduced rate of 5% will apply until July 2007. For electricity and natural gas the full rate of 22% went into force in January 1998. From January 1995 to May 2000, fuel and electricity prices increased by 106.7% (the highest of all categories) while the price index of all goods and services increased by 37.5%.

Although the law gives similar provisions for electricity and gas, both markets develop in remarkably different fashion. While liberalization proceeds quickly in electricity market, little has been achieved in gas (first customers will be able to choose a supplier market only in 2005 and full liberalization is not at all envisioned in the law). On the other hand, while privatization has been a dominant trend in gas market (privatization of Transgas in hands of RWE in 2002), privatization plan of dominant electricity market players has been abandoned. This asynchronous development, resulting from the absence of governmental strategy for energy sector, creates imbalances which might lead to disturbances within the Czech energy market.

At the moment, new energy legislation and a new governmental strategy is being prepared.

1.3. International relations

EU

The Energy chapter of the EU accession negotiations has been opened in November 1999 and closed provisionally in December 2001. The Czech Republic negotiated two transition periods:

- creation of the emergency oil stocks (until the end of 2005)
- liberalization of gas market according to the Directive 98/30/EC (28% opening of the gas market until the beginning of 2005).

Kyoto Protocol

The Czech Republic has ratified the Kyoto Protocol in November 2001. The commitment of the Czech Republic comprises the 8% decrease of the greenhouse gas emissions from the level reached in 1990. At the moment the Czech Republic produces 26% less greenhouse gases than in 1990 as a consequence of the substantial decline in the industrial production during 1990s. This development creates a big potential for the emissions trading once that scheme becomes operational.¹ In spite of the positive progress, the Czech

¹ According to the European Parliament proposal, the EU member states should create a system (including legislative provisions) for emission trading scheme by the end of 2003, the trading should start in 2005.

Republic has still one of the highest levels of greenhouse gas emissions per capita in Europe (e.g. in 1999 the level was about twice higher than the emissions per capita in Hungary). The share of the Czech Republic in the world's total greenhouse gas emissions is roughly 1%.

2. Basic features of the electricity sector

Electricity is of growing importance in the Czech energy sector since power production has remained roughly stable despite an overall decline in TPES of 19% between 1990 and 1999. At the end of the 1990s, electricity accounted for about 18% of total fuel consumption. However, in respect to the national economy, the share of the sector is slightly diminishing. In 2001, the electricity, gas and water sector produced about 4% of value added (5% in 1995), accounted for about 5% of the national output (6% in 1995) and for about 1,5% employment in the civil sector.

2.1. Generation and capacity

The electricity generation increased nearly by 17% from 1990 to 2000. In 2001, electricity generation amounted to 75 TWh (6.8 Mtoe). Power generation will further augment, after the Temelin nuclear plant reaches its entire generation capacity.

Electricity is still generated mostly by coal (72.5 % in 2000) and nuclear power (18.6%). The share of natural gas has increased in the 1990s but remains limited to 4.6% of total generation, just above hydropower (2.6%).

The commissioning of the Temelin **nuclear** plant is expected to double the share of nuclear power at the expense of coal-fired generation, whose output would drop by 20% of the total. Besides well-known Temelin, there is only one other nuclear plant in Dukovany (soviet-built, four blocks) which is supposed to be in operation until 2025.² The future use of **coal** for power generation is limited by environmental limits on extraction which are determined in tons for each brown coal mining site (see Table 3). The available reserves of brown coal are expected to be exhausted by 2040 if the environmental limits are respected. **Gas** generation to date is mainly limited to a few independent power producers (IPPs). **Hydropower** is used primarily for peak load, including 1.1 GW of pumped storage facilities.

Installed capacity has increased by 8% since 1993 to 15.44 GW in 2001. Since peak demand amounts to 10.6 GW (in 2001), it implies a reserve margin of over 50%, well above domestic demand. Capacity reserve margin is expected to increase more substantially in the near future, as the Temelin nuclear plant (1.8 GW) comes fully on line.

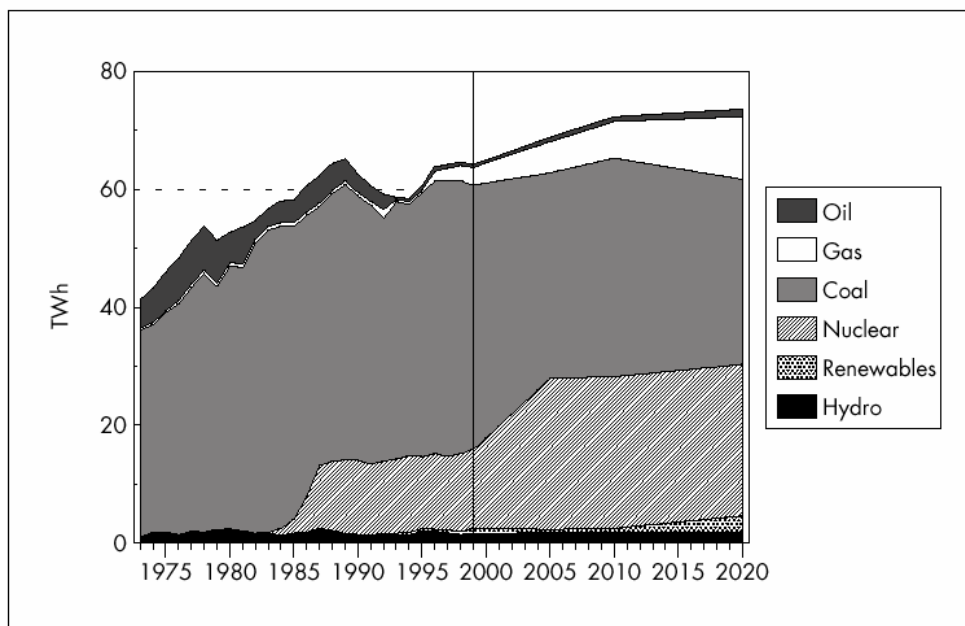
Table 2. Electricity generation by energy sources (shares in %)

	1990	2000	2010
Coal	71,8	72,5	51,3
Oil	4,8	0,6	1,1
Natural gas	1,0	4,6	8,6
Nuclear	20,1	18,6	35,5
Renewables*	2,3	3,6	3,5
Total (in TWh)	62,6	72,9	75,2

* includes hydropower, energy from waste
Sources: IEA/OECD, Deutsche Bank Research

² At the Temelin NPP, two units are currently in different stages of commissioning. Test operations of the first reactor unit of the Temelin NPP were completed in June 2002 with full power operation attained. Presently the unit is undergoing trial operation, the last stage of commissioning prior to receiving a license for commercial operation.

Figure 5. Electricity generation by fuel 1973-2020



Source: Energy Policies of IEA Countries – Czech Republic 2001 Review, IEA, 2001

Table 3. Proposed extraction limits for commercial mining 1995-2030 (in million tons)

	1995	2000	2005	2010	2015	2020	2025	2030
Brown coal & lignite	52,24	49,78	45,48	43,7	43,5	38,0	35,0	29,0
Hard coal	19,97	14,10	11,82	11,0	9,4	4,0	2,0	1,0

Source: Ministry of Industry and Trade

2.2. Electricity consumption

Figure 6 and 7 shows the development of electricity consumption in the 1990s. We can see the dynamics of demand copies more or less the economic cycle. In 2001, total electricity consumption amounted to 50 TWh (4.1 Mtoe), 4% below the 1990 level.

Between 1990 and 1999, industry reduced its consumption by 30% and now represents 39% of total consumption, comparable to the OECD average share. The household sector increased its consumption by 50% to 14.5 TWh in 1998 compared to 1990 and the service sector nearly tripled its consumption to 10.3 TWh. Consumption by autoproducers (mostly chemical industries) represented 11.5% of total consumption in 1998.

Figure 6. Net electricity production and consumption 1990-2001

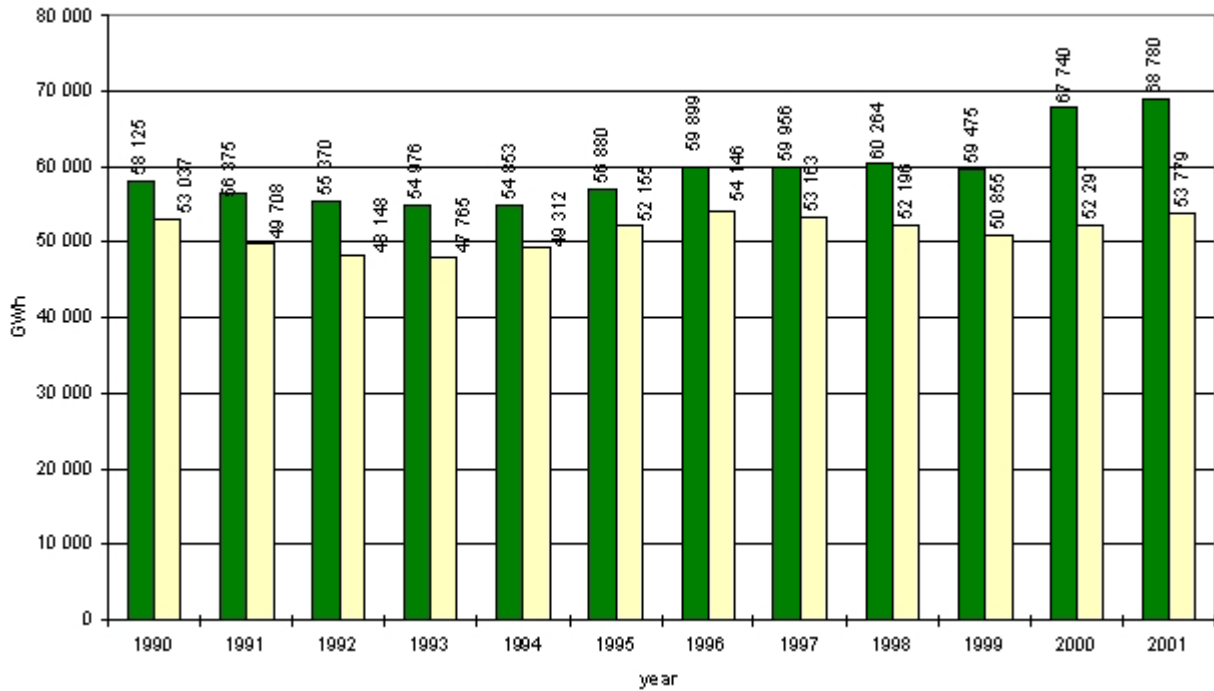
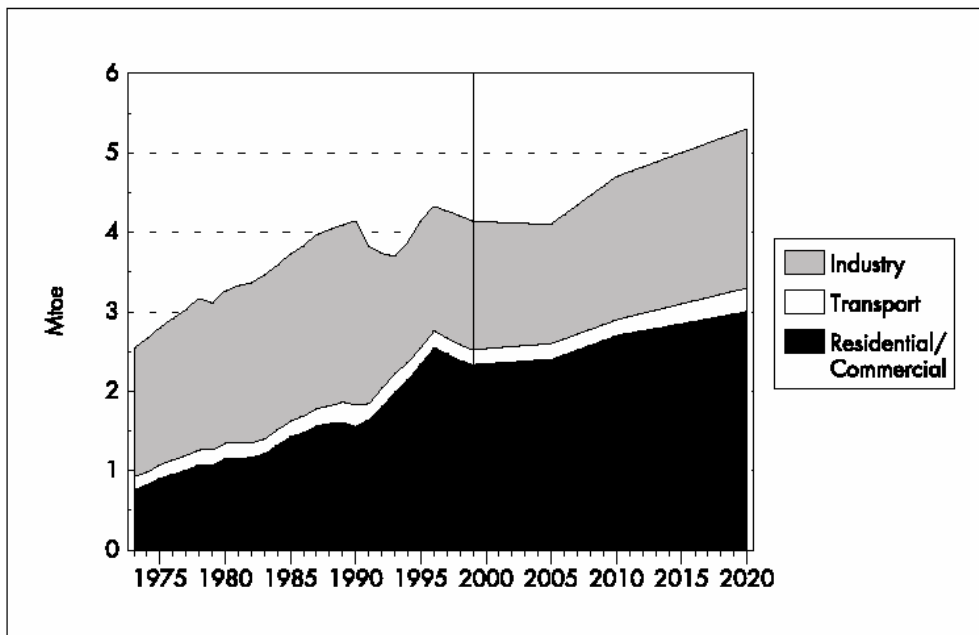


Figure 7. Electricity demand by sector 1973-2020



Source: Energy Policies of IEA Countries – Czech Republic 2001 Review, IEA, 2001

2.3. Transmission and international trade

The high-voltage transmission network is a 400 kV/220 kV system. Transmission and distribution losses are gradually decreasing, but are still higher than the OECD average (7.5% of total electricity supplied in 2001 compared to 6.6% in OECD). There are no significant internal constraints at present.

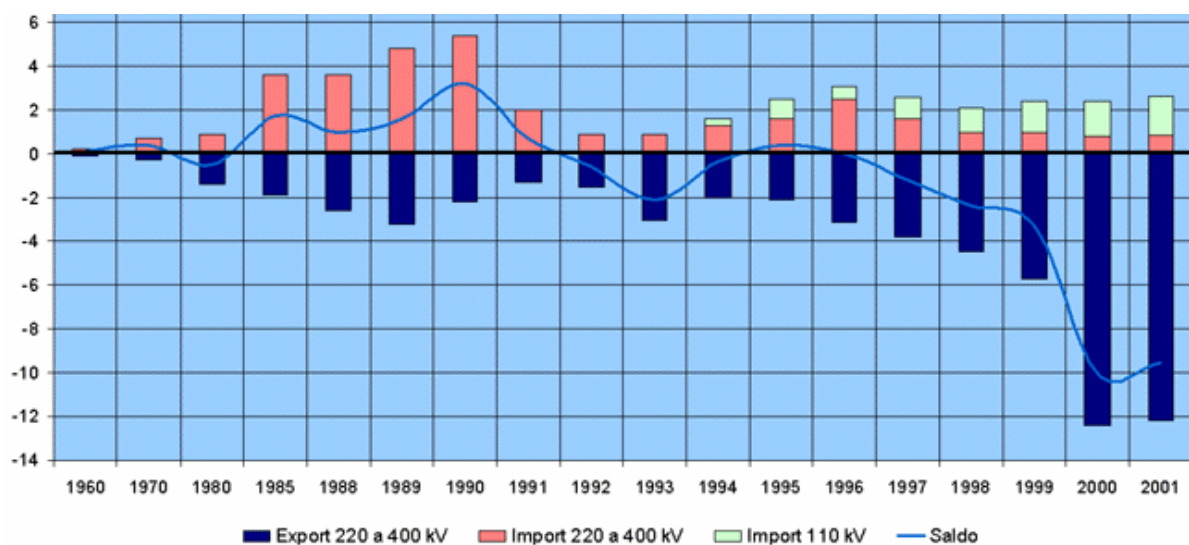
The network has interconnections with Germany, Austria, Slovakia and Poland. The Czech Republic is a member of the Union for the Co-ordination and Transmission of Electricity (UCTE) since 1995 and of CENTREL, regional association founded in 1992 with three other Central European countries.

Although CEZ, a.s. has a monopoly on high-voltage international trade, some of the distribution companies have international interconnections at lower voltage and have used these to import electricity. In 1999, the distribution companies accounted for 1.4 TWh of the 2.4 TWh of imports in an attempt to diversify resources away from CEZ. This tendency has strengthened after the partial liberalization for major consumers, including distribution companies, in 2002.

Today, the Czech Republic is the second biggest electricity exporter in the EU 25 (after France).

Since 1996, trade with electricity has shown a stable positive balance with exports still augmenting. In 2001, net electricity exports amounted to 9.5 TWh³ (0.86 Mtoe). The increase in sales volume in 2000 (+6.7 TWh) was accompanied by a fall in the average export price from CZK 0.75/kWh to CZK 0.57/kWh (still above the variable cost of coal-fired electricity of CZK 0.3-0.5/kWh). In 2001, exports of CEZ, the main generating and exporting company, fell by 2.5% (307 GWh), as a result of interruption of supply contract from the part of German E.ON in July, following action by distribution companies and customers against Temelin, and interruption of supplies for bankrupting American company ENRON. For development of electricity imports and exports, see Figure 8. For structure of international trade, see Table 4.

Figure 8. Electricity imports and exports 1960-2001 (in TWh)



Source: Energy Regulatory Office.

³ In fact, the number could be much lower due to „fictive exports“. Electricity traders – primarily foreign firms - buy electricity from CEZ for a price paid in destination markets lowered by transaction costs. The contract is provided with a clause that the amount of electricity is intended exclusively for export. (In respect to this clause, CEZ was fined in January 2003 by the Czech antimonopoly office for abuse of dominant position). However, the trader does not export the electricity, but sells it in the domestic market and realizes extremely high profits. The evidence is only indirect (e.g. a sudden quadruplication of fees for trans-border transmission in auctions creates suspicion that traders artificially increase fees to increase profits). The volume of these „fictive exports“ is assessed to 0.6-1.2 TWh, corresponding to about 5-10% of the official electricity exports.

Table 4. Electricity interconnections and trade in 2000

	Capacity (MW)	Imports (TWh)	Exports (TWh)	Net exports (TWh)
Germany	2100	-	10.8	10.8
Austria	750	-	0.4	0.4
Slovakia	1500	1	0.3	-0.7
Poland	1200	0.8	-	-0.8
Italy	-	-	0.9	0.9
Switzerland	-	0.6	-	-0.6
Total (in TWh)	5550	2.4	12.4	10

Source: Energy Policies of IEA Countries – Czech Republic 2001 Review, IEA, 2001

Development of international trade is limited by several factors. In certain situations, the Ministry of Industry and Trade can restrict electricity imports (see further - part Regulatory framework). Trade is also physically limited by transit of electricity from Poland and by a strong induced “loop” flow of electricity through the Czech system arising from electricity trade between Poland and Germany. As a consequence, there were 6.6 TWh of transit flows across the Czech Republic in 1999, of which only 2 TWh were contracted transit. These loop flows and other factors limit the annual export of electricity to 12-14 TWh.

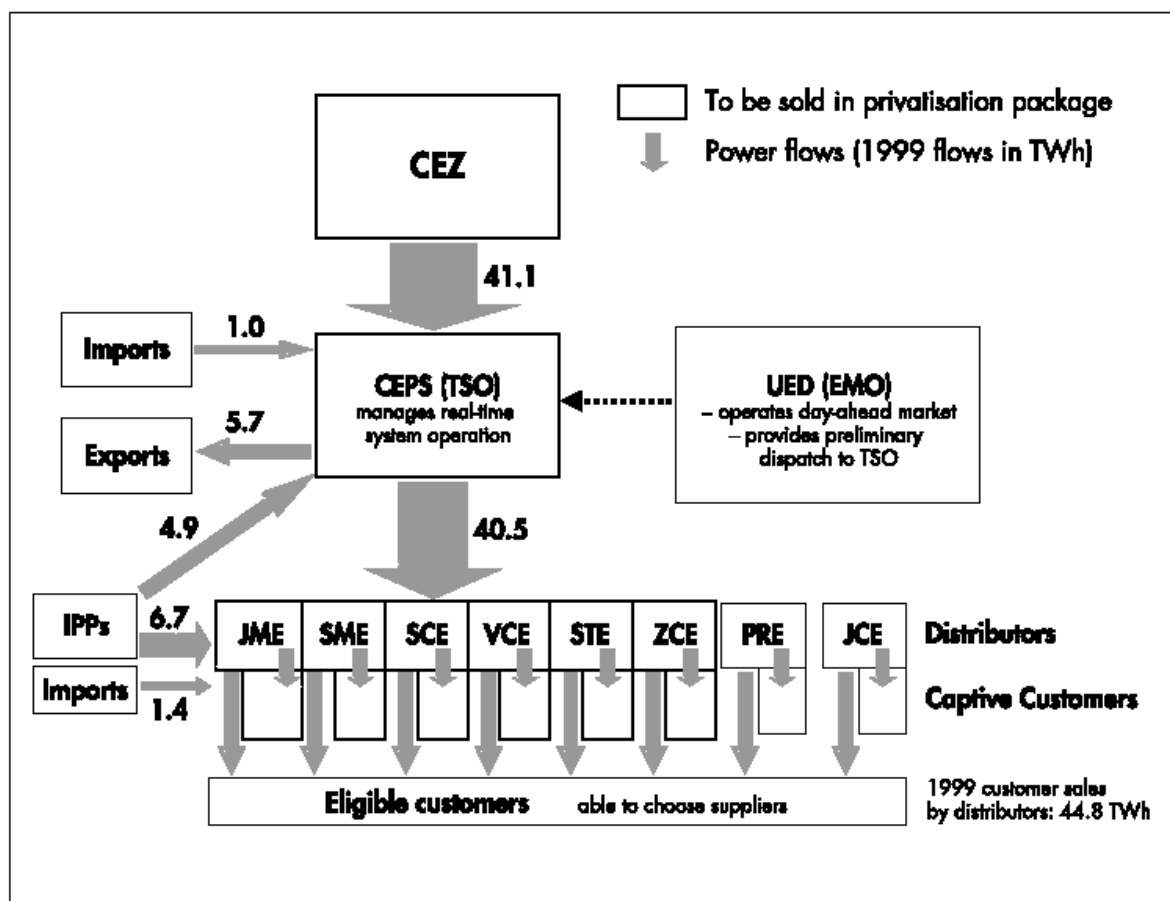
Trade can be further limited by political factors. As a protest against the start-up of the Temelin nuclear power plant, the Austrian government stated that it will not allow new contracts for power imports from the Czech Republic. Also, as mentioned earlier, in June 2001, E.ON Germany announced its intention to cancel a 3 TWh supply contract with CEZ, a.s. following action by distribution companies and customers against Temelin.

2.4. Electricity sector structure

The state electric utility was unbundled in 1992 to create CEZ, a.s., which was responsible for generation, transmission and the operation of the system. In 1990, eight regional distribution companies (REAS) were established, and they were partially opened to foreign investors in 1994. The district heating companies have been restructured and privatized, as regional Independent Power Producers (IPPs). The structure of the market at the moment of partial liberalization can be seen in Figure 9a.

The first foreign investors entered the electricity sector through local distribution companies through purchasing the shares (pre-emption connected with vote) from local municipalities, e.g. E.ON, GESO, RWE, Energie AG Oberösterreich, Mitteldeutsche Energie Versorgung. This (‘wild’) method of privatization was not supported by the government and is going to lower the state’s gains from privatisation. Foreign investors entered also IPPs.

Figure 9a. Czech electricity market structure (1999 power flows in TWh)



Source: Energy Policies of IEA Countries – Czech Republic 2001 Review, IEA, 2001

CEZ, a.s.

CEZ, a.s. (Ceske energeticke zavody), a majority state-owned generating company, owns approximately two-thirds of total Czech generating capacity and produced in 2001 about 70 % of all electricity generated. Its activities are above all electricity generation, transmission, import and export. CEZ, a.s. owns the only operating nuclear power plant in Dukovany and is bringing a new one into operation, at Temelin. It also owns the transmission system through its subsidiary, CEPS a.s., and 39% of Severoceske Doly-SD, the largest brown coal mining company. In April 2003, CEZ took over the state's share in distribution companies and will sell the transmission system CEPS to the state (for more see chapter 2.5.).

The share of CEZ on electricity generation in the Czech Republic has been steadily diminishing from 79% in 1993 to 70% in 2001, as well as coverage of domestic demand from 74% in 1993 to 65% in 2001. Most recently, however, this decline has stopped and slightly reversed.

CEZ, a.s. has been a joint stock company since 1992, with shares traded on the Czech stock exchange. CEZ is 68% state-owned, 4% are in hands of small shareholders, 11% is administered by CSOB bank and about 17% are owned by various institutional investors. Approximately 11% of its shares are foreign-owned.

Recently, CEZ has considerably strengthened its position through acquiring control over half of distribution companies (for more see Chapter 2.5.)

IPPs

Independent Power Producers (IPPs) constitute 5.1 GW of capacity and generated about 22.5 TWh (30%) in 2001. IPP development has benefited from distribution utilities' diversifying their supply sources away from CEZ, a.s. As a result, IPP capacity and generation have grown by nearly 50% since 1993 while CEZ's share of generation diminished from 79% in 1993 to 69% in 2001. CEZ, a.s. itself purchased about 3,3 TWh of power from independent producers and industrial plants in 2001. IPPs sell their power also to the local distribution companies.

Individual IPP companies are relatively small compared to CEZ, a.s., and most supply heat as well as electricity. The tradition of co-generation in large industrial undertakings is rather strong in the Czech Republic compared to other European countries. Most important IPPs are Elektrarny Opatovice, Sokolovska uhelna and ECK Generating.

There has been some foreign acquisition of capacity. Cinergy, a U.S. utility, owns over 1,000 MW of CHP power generation facilities. International Power of the UK owns three plants and over 700 MW of CHP capacity. United Energy, a subsidiary of the U.S. company National Fuel Gas, has three CHP plants totalling 236 MW. Dalkia (France), a subsidiary of Vivendi and Électricité de France, owns a total generating capacity of 360 MW through its interests in district-heating companies based in Northern Moravia.

CEPS

In January 1999, the Czech Electricity Transmission System (CEPS) was set up as a 100% subsidiary of CEZ. CEPS owns the transmission network and was established as the transmission system operator (TSO) in line with the EU Electricity Directive (separation of generation from transmission). CEPS's responsibilities include: controlling flows in the power grid, co-ordinating with foreign networks and assuring that current facilities dispatch electricity efficiently. In April 2003, CEPS was transferred in the hands of state, thus the separation of generation from transmission became effective also in terms of property.

Distributors - REAS

The eight distribution companies (Table 5 and Figure 9), created in 1990, supply nearly all final consumers (except for approximately 6 TWh used by industrial autoproducers and 0.1 TWh sold by CEZ, a.s. directly to consumers). Their exclusive territories copy borders of former socialist regions.

Ownership of the regional companies was originally in the hands of the State Property Fund. For each company, about 34% of the ownership was transferred to municipalities, and another 15% was sold to the private sector through voucher privatization. In 1997, many municipalities started to sell their shares (more precisely, pre-emption) to foreign companies. This „spontaneous privatization“ was inconvenient both for the state (whose shares lost their value as other investors acquired control packages) and for municipalities (that receive a much lower price). The government decided in 1998 to regain majority control over the distribution companies, through share purchases by CEZ, before carrying out full privatization.

Until recently, the state was the majority shareholder in five companies (SME, SCE, VCE, STE, ZCE), and a minority shareholder in three companies (PRE, JME, JCE), which are controlled by shareholder coalitions between private investors and municipalities. As a result of “super-merger”, effective on 1 April 2003, state shares in distribution companies were taken over by CEZ (for more see chapter 2.5.). The second most important shareholder is German E.ON Energie, which has majority shares in two distributors and minority share in further four companies and owns about 17% of total shares in distribution companies. Other foreign investors with significant holdings are German and Austrian utilities RWE, GESO, Energie AG Oberösterreich and Mitteldeutsche Energie Versorgung and French Electricite de France (EdF). Table 5 ranks the eight companies by number of customers, along with significant shareholders.

Table 5: Electricity distributors in the Czech Republic

Distributor	Ownership structure (December 2002)	Ownership structure (April 2003)	Number of customers (Dec 2000)	Electricity sales (2001, in TWh)
Jihomoravská energetika (JME)	44,9 % E.ON 33 % FNM 2,21 % CEZ	44,9 % E.ON 35,2 % CEZ	999 500	7.1
Severomoravská energetika (SME)	48,66 % FNM 29,8 % E.ON 10,44 % CEZ 9,2 % EdF	59,1 % CEZ 29,8 % E.ON 9,2% EdF	924 500	8.3
Jihoceska energetika (JCE)	34 % FNM 13,3 % E.ON 33 % cities	34 % CEZ 13,3 % E.ON 33 % cities	672 000	4.7
Vychodoceska energetika (VCE)	49,62 % FNM 41,7 % E.ON 0,45 % CEZ	50 % CEZ 41,7 % E.ON	655 000	6.5
Zapadoceska energetika (ZCE)	50,26 % FNM 36,9 % E.ON 11,21 % Energie AG Oberösterreich 1,98 % CEZ	52,24 % CEZ 36,9 % E.ON 11,21 % Energie AG Oberösterreich	653 000	5.9
Severoceska energetika (SCE)	48,5 % FNM 28,93 % Mitteldeutsche Energie Versorgung 5,9 % E.ON 4,37 % RWE 2,57 % city of Most 2,25 % CEZ	50,75 % CEZ 28,93 % Mitteldeutsche Energie Versorgung 5,9 % E.ON 4,37 % RWE 2,57 % city of Most	643 500	5.7
Stredoceska energetika (STE)	58,3 % FNM 34,98 % RWE	58,3 % CEZ 34,98 % RWE	482 500	3.9
Pražská energetika (PRE)	50,77 % Pražská energetika Holding (Prague, RWE, GESO Betelligungs) 48,19 % FNM	50,77 % Pražská energetika Holding (Prague, RWE, GESO Betelligungs) 48,19 % CEZ	398 000	3.3

Note: In the case of JCE, municipalities are only formal owners of 33% shares, the voting rights are in hands of foreign investors (mainly E.ON).

FNM = Fond narodního majetku (National Property Fund), administrator of the state property intended for privatisation.

Sources: Energy Regulatory Office, internet sites of the companies, MF Dnes 13.12.2002.

2.5. From privatization to “super-merger”

The electricity sector was partially privatized in the early 1990s. In 1998, the government decided to consider a process for selling the rest of its shares in the sector. From the outset, the government made clear that the privatization would need to meet a number of objectives, including the maximization of revenues, the assurance of sector stability, and assurance that there would be no adverse impact on competition.

Although the government relinquished majority shareholdings in the distributors, it retained a large minority shareholding of just under 50% through the National Property Fund (NPF). Through CEZ, the government began to re-acquire shares in the distributors in order to include distribution as part of a privatization package. The Office for the Protection of Economic Competition wanted the sales to guarantee the vertical separation of generation from transmission.

In late 2000, the government decided to sell 64% of its 67% stake in CEZ and all shareholdings in six regional electricity distributors (in which it had a majority) to one strategic investor by 2002. The new owner would also acquire the transmission subsidiary, CEPS. The governmental plan of privatization which aimed at finding a strategic partner for CEZ, a strong and recognized actor at European field, was not successful, since bidders did not offer a sufficiently high price according to the government.

Therefore, the government decided in March 2002 to abandon the privatization scenario and merge CEZ a.s. and local electricity distribution companies into one legal entity which could be sold subsequently the whole package. Under this plan, CEZ would gain a majority position in five of the distribution companies and a blocking minority in three of them. The state, in its turn, was supposed to receive from CEZ 66% share in CEPS, the high-voltage transmission grid. The state's share in the distribution companies was estimated to roughly 32 billion CZK and 66% of CEPS to 15 billion CZK. Therefore, the state should receive 17 billion CZK from CEZ in several payments by 2006.

The “**super-merger**”, as the transaction is often called, is generally considered as being controversial by competition law experts and had been blocked for along time by the Czech antimonopoly office. There were two objections: one concerned the credibility of the assessment of distribution companies – due to a relatively “low” price, there is a suspicion of a hidden state aid for CEZ. The other objection questioned the integration from the point of view of its impact on competition (dominance in the sector).

The government's argues the merger would increase competitiveness of CEZ and guarantee a better negotiation position when selling the state's share in CEZ, restructured by the transaction. Also, this solution is supposed to guarantee a separation of the transmission grid operator (CEPS) and electricity generator (CEZ) in terms of property. The advantage for merging electricity generator (CEZ) and distributors (REAS) is seen in optimization of the process of “coal extraction-generation-transport-supply”, which might lower the cost for end-customers. The government also believes that the electricity market structure is consistent with the principles of liberalization in the EU as well as with the pattern of other vertically-integrated utilities in Europe which increase in size through mergers and acquisitions, instead of being broken up.

In late March 2003, about a year after the decision on creating Super-CEZ, the antimonopoly office gave a green light to the super-merger under the condition that CEZ would sell its three minority shares and one majority share. Therefore, CEZ's acuirements will be eventually limited to four distributors where the state has a majority.

The “super-merger” took place on 1 April when CEZ took over its shares in distribution companies. As a result, a great concentration of power took place. Instead of removal of monopolistic market structure, the government reversed the trend in re-concentrating power in the hands of former era incumbent. The second part of the final plan – to sell the whole package to a strategic investor - has been abandoned for the moment;

the government does not expect the privatization of CEZ before 2004. The Ministry of Industry and Trade gives priority to up-dating the energy policy before privatization.

CEZ started to strengthen its positions very early. In the first weeks after having taken over the state shares in distribution companies, CEZ organized extraordinary shareholder's meeting in five companies where it controls the majority. In ZCE, VCE and SME, CEZ achieved displacement of representatives of E.ON, the second largest shareholder (30-40%!), from the supervisory board and changes in the management. E.ON considers this CEZ's manoeuvre which disvalues its holdings in distribution companies rather non-standard and contradictory to good manners in Western countries. Austrian Energie AG decided to leave the Czech concentrated market and sell its shares where E.ON is the first and most significant party concerned.

At the same time, CEZ started negotiations with foreign investors on selling its three minorities and one majority as requested by the Antimonopoly Authority. In particular, CEZ suggested an exchange of its minorities in JCE and JME for E.ON's minorities in ZCE and VCE. As for its minority in PRE, CEZ negotiated with RWE, a majority-holder of PRE. CEZ also needs to find a buyer of one majority – CEZ chose to sell SCE. The reasons, according to experts, are that: many SCE's customers are burdened by a threat of insolvency, sustainability of its contracts is questionable and the market is vulnerable due to concentration of authorized customers. Moreover, CEZ believes to be able to ensure its strategic interests in the region through its own coal-fired power plants. Further, legislation requires CEZ to offer buyback of minorities in companies where it acquired a majority

As a final evidence of CEZ's reinforced position, CEZ announced its intention to expand to foreign markets in terms of property, e.g. in electricity distribution in Poland or Slovak incumbent Slovenske elektrarne.⁴ The reason is that CEZ's production capacity exceeds its distribution possibilities through CEZ-owned distribution companies.

In every case, the "super-merger" created a highly concentrated market structure with one company controlling 70% of electricity production and almost a half of its distribution. CEZ can profit from synergies resulting from restructuring of commercial activities or integration of other activities (cost savings are assessed to 10 – 100 MEUR). After the super-merger, CEZ even feels confident enough to expand to foreign markets through FDI (although before the merger, only voices on capital weakness of Czech actors and a need for investors were heard).

The controversial super-merger could take place only due to a **strong linkage between the CEZ's and governmental policy**. When justifying its decision to integrate CEZ with distributors, the government uses identical language with CEZ (wording in Annual Reports is identical with some ministerial declarations). The decision was made although it is unprofitable for the state budget; an alternative plan supported by economic experts and the Ministry of Finance was to sell four distribution companies directly from state to foreign investors instead of the intermediation provided by CEZ – the state would receive a better price than from CEZ (up to 25 billions CZK). A decision inconvenient for the government, but very convenient for CEZ. "CEZ is stronger than the government", can be heard from various parties.

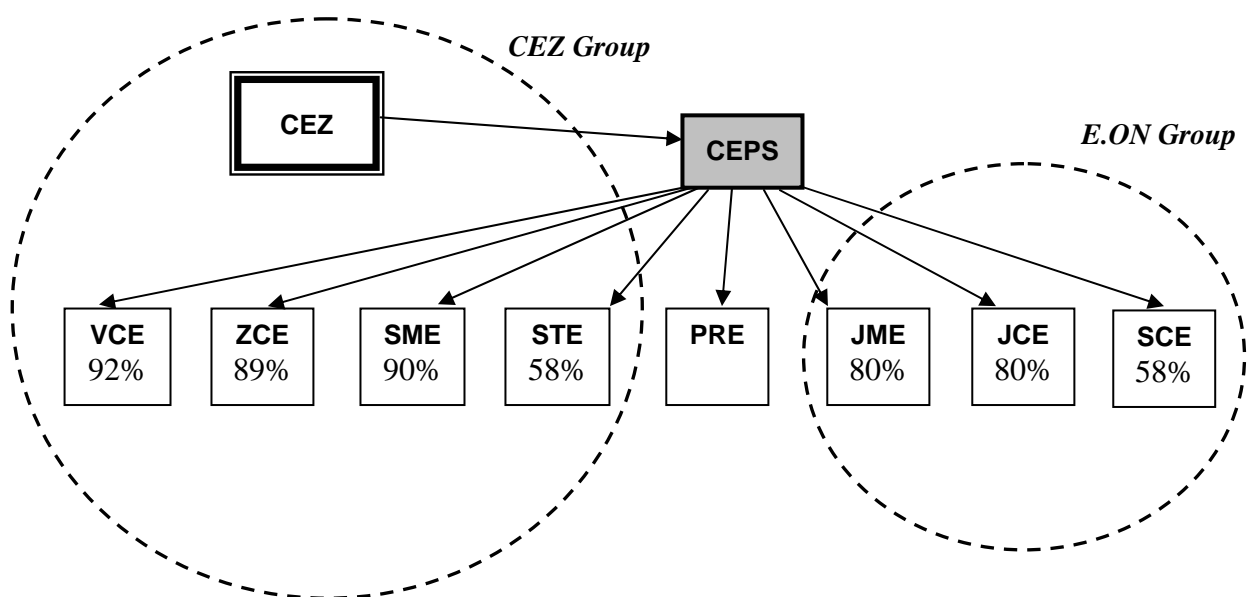
⁴ CEZ answered to tender for privatization of Slovenske elektrarne, its bid, however, came late. Yet, CEZ's chances are not lost – it is the only investor interested in the whole privatized package. A question is whether CEZ will have enough funds to undertake the purchase since it has to pay for the newly acquired shares in distribution companies.

“Super merger” in Short

- *Governmental decision (March 2002, confirmed March 2003):* CEZ will buy the state shares in eight distribution companies (32 billion CZK) and sold to state 66% of the transmission system CEPS (15 billion CZK).
- *Antimonopoly Authority’ decision (March 2003):* CEZ must resell its minority shares in three distribution companies (JCE, JME, PRE), its majority share in one company (CEZ opted for SCE) and the remaining 34% of CEPS to a subject not connected to CEZ.
- Super-merger takes place on 1 April 2003.
- CEZ changes the composition of supervisory boards in majority-owned distribution companies (ZCE, VCE, SME) – E.ON representatives are displaced.
- CEZ negotiates with foreign investors in order to sell minorities as requested; it suggests an exchange of its minorities in JCE and JME for E.ON’s minorities in ZCE and VCE. Some foreign investors leave the Czech market.
- CEZ announces its interest in property expansion to foreign markets (Slovenske elektrarne, Polish distribution companies).

Figure 9b shows a possible future structure of the market after super-merger and consequent developments (given all facts, as well as indicative information known today). It highlights the concentration in the market and its division between two major players CEZ and E.ON.

Figure 9b. Property market structure after super-merger (prediction)



Note: Percentage points show the shares of CEZ/E.ON in the respective distribution companies.

2.6. Regulatory framework

The electricity sector is regulated by the **Energy Act** No 458/2000, which was signed in December 2000 and came into force in January 2001. It is fully compatible with the EU Directive EC/96/92 and sets out the legal and regulatory framework for liberalization of the Czech electricity market. The main features of the act are:

- A timetable for liberalization of electricity consumers (*free choice of the supplier*):
 - On 1 January 2002, consumers with annual consumption of more than 40 GWh became eligible (over 30% of the market, corresponding to 66 major consumers);
 - On 1 January 2003, the threshold was lowered to 9 GWh (over 40% of the market, corresponding to about 400 major consumers);
 - On 1 January 2005, all end-users except those consuming less than 0.1 GWh annually will be eligible (estimated opening is over 50% of the market);
 - On 1 January 2006, all end-users (100% of the market).
- The Act introduces liberalization of the access to the networks in line with the *regulated third party access model*. Access to the networks will be guaranteed to all generators over 10 MW as of 2002, and all generators as of 2003. Entry into generation is liberalized and the Ministry of Industry and Trade is responsible for authorization. A *licensing system* is introduced for regulating the activities of all electricity market players (except consumers). However, unlike the EU model, licenses are not awarded on the basis of fulfillment of conditions, defined clearly in the legislation, but are dependent on the case-by-case assessment by the regulator.⁵
- *An independent regulator*, the Energy Regulatory Office (ERU), established in 2001, regulates prices and terms of access to networks, as well as prices charged to customers not yet liberalized. The responsibilities of ERU are:
 - Concession and revocation of licenses to energy market participants for generation, transmission, distribution and trading.
 - Establishment of tariffs (wholesale, consumer and ancillary services) for electricity, natural gas and heat for captive⁶ customers, such as households and services.
 - Regulation of connection conditions, trading rules and the quality of supplies;
 - Protection of captive customers.
 - Application of sanctions and penalties for violations of regulations.
 - Settlement of disputes, including those over third party access.⁷

⁵ For example, an applicant must manifest not only his technical qualification, but also his financial qualities. As a result, the licensing system gives priority to large companies

⁶ Sometimes „captive customer“ also translated as „protected customer“ (an exact translation from Czech). The term „eligible customer“, for its part, is sometimes translated as „authorized customers“.

⁷ In a difficult environment, characterized by industry restructuring and privatization as well as market liberalization, the Energy Regulatory Office has been able to assume a relatively independent position, demonstrated by decisions on high profile cases such as the allocation of infrastructure capacity for electricity imports.

- An independent *transmission system operator* (TSO) and *distribution system operators* were created to manage the operation of these networks. The role of TSO was assigned to CEPS, a subsidiary of CEZ. It is also responsible for developing the grid code and managing the supply of ancillary services.
- An *Electricity Market Operator* (OTE) was established in 2001, majority-owned by the government, to replace the Central Dispatch Center (UED). It is responsible for organizing/operating the short-term electricity market, operating a financial settlement system for that market, and providing electricity balances for system operation to the TSO, forecasting demand and supply⁸

The remaining responsibilities of the Ministry of Industry and Trade (MIT) in the electricity sector are:

- Authorizing new generation units and transmissions facilities above 30 MW capacity; units below 30 MW are approved by regional authorities.;
- Restricting electricity imports in certain situations:
 - » When the obligations of electricity generators and authorized customers in the country exporting power to the Czech Republic are not comparable to the rights and obligations of generators and customers in the Czech Republic (i.e. reciprocity);
 - » When the environmental effects of electricity generators in the exporting country are not comparable to the rights and obligations of generators and eligible consumers in the Czech Republic;
 - » In addition, until 1 January 2005, the act empowers the MIT to limit imports on the basis of “danger that the safety and reliability” of the Czech electricity system may be affected.

According to the Act, distributors have an obligation to serve captive consumers. A separate fund, provided by distributors and administrated by ERU, is available to compensate suppliers required by the regulator to supply electricity to customers whose suppliers are unable to fulfill their obligation.

Generators of electricity from CHP and from renewable sources have a priority access and the right to sell their electricity to the local distributor.

At the moment, a new energy act is being prepared by the MIT.

2.7. Employment

Employment in the electricity sector has been in steady decline since the beginning of the transition. The number of employees in the electricity, gas and water sector dropped by 23% between 1995 and 2001. In 2001, the sector employed about 70 000 workers, corresponding to 1,5% of total employment in civil sector.

⁸ The Electricity Market Operator has had a relatively successful start in organizing and operating the short-term electricity market. In the first months the Operator, equipped with a 2002 budget of €6.6m and 22 staff, handled some 2%-3% of the whole market volume. However, the positive development stalled. Today, the short-term market for electricity trading has struggles to build enough trading volume. The Czech market for electricity trading is simply not big enough or active enough. The extent of the organized short-term, spot market is less than 1 percent of the Czech electricity market. As a result, the market operator has begun considering its options, including cooperation with the German, Slovak, Hungarian or Polish markets. Besides, OTE and CEPS are preparing same-day electricity trading, it could be ready to be launched by July. However, the innovation might not do that much to boost the overall level of electricity trading carried out by the OTE. A PHARE-financed project aims to ensure an efficient functioning of the OTE in the Czech electricity market.

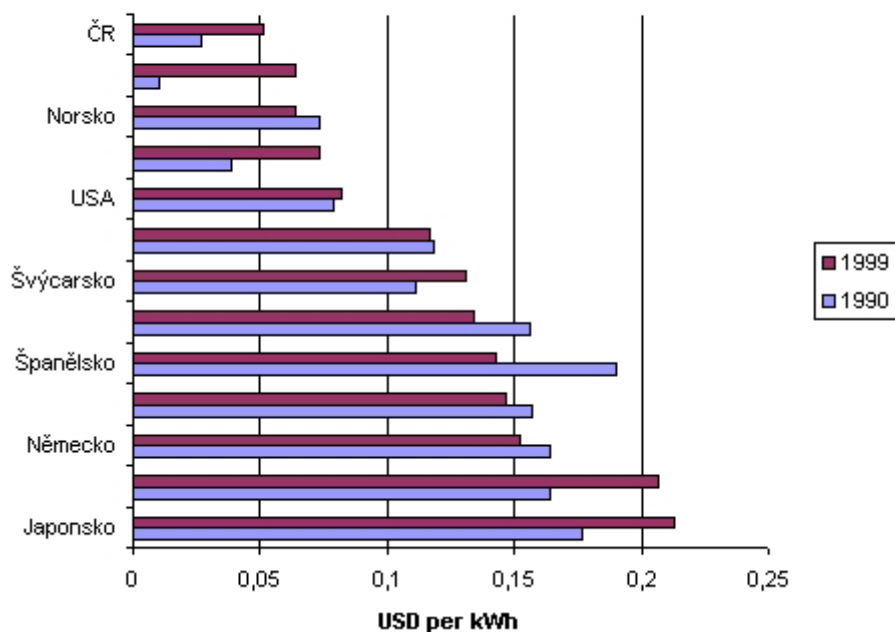
2.8. Electricity prices and costs

During the first decade of transition, there were no market prices in the Czech electricity. Prices were set by the regulator on the basis of costs to produce „adequate“ profit. Such a method of regulation resulted in a situation where energy companies persistently belonged to firms with the highest profits in the Czech Republic (CEZ on the first place in 1997 and all distribution companies between the 10th and 25th place).⁹

In the Czech Republic, the birth electricity market suffered from heavy **cross-subsidies**. The prices for households were below cost-recovery levels and were subsidized by industrial and commercial customers who paid an above-cost price. According to MIT analysis, pre-tax prices for households in 1997 were 65% lower than costs. The reverse price structure was a rarity in European terms (in late 1990s, it existed only in Russia, Latvia and Slovakia).

Not surprisingly, an international comparison reveals that household prices are still the lowest in the OECD (Figure 10). In 2000, they were still 50% lower than the average for European OECD countries. Industrial electricity prices are also among the lowest in OECD countries (Figure 11). However, if we made a comparison based on PPP shows, industrial prices would appear rather high in the Czech Republic.

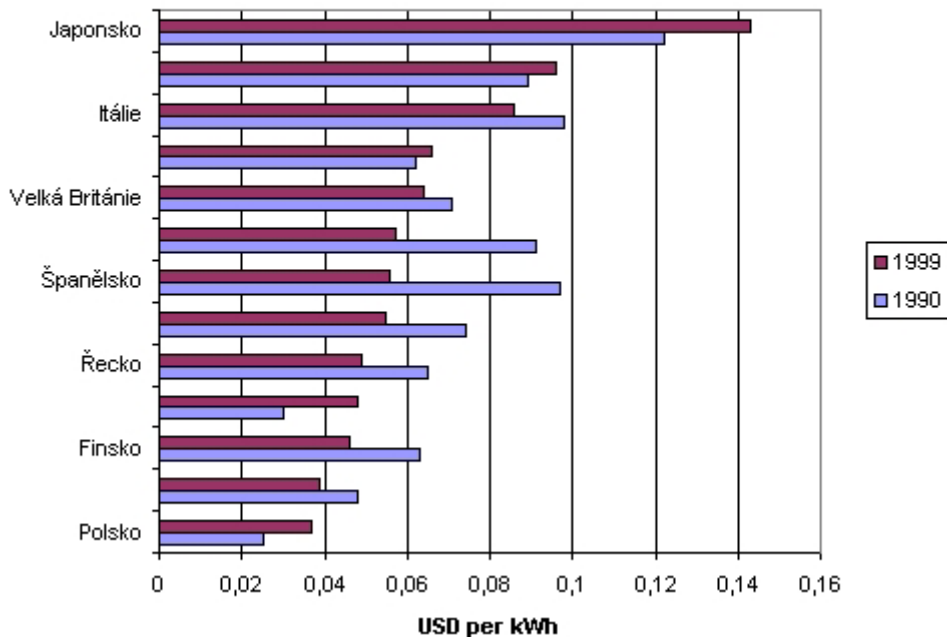
Figure 10. Electricity prices in selected OECD countries, household sector (1990 and 1999)



Source: Energy Regulatory Office, 2001 Annual Report on Operation of the ES Czech Republic, 2002

⁹ Also the method of cost-related pricing caused problems on an international level. In 2000, Austria submitted to the European Commission an accusation of dumping carried out by CEZ. CEZ was accused of selling electricity at a half of production price. However, the complaint was not successful, because under the cost-related pricing method, the regulator sets the price according to information provided by the generator who, naturally, tries to exaggerate in order to ensure a higher price. Thus, it is problematic to derive actual production costs from the costs recognized by the regulator.

Figure 11. Electricity prices in selected OECD countries, industry sector (1990 and 1999)



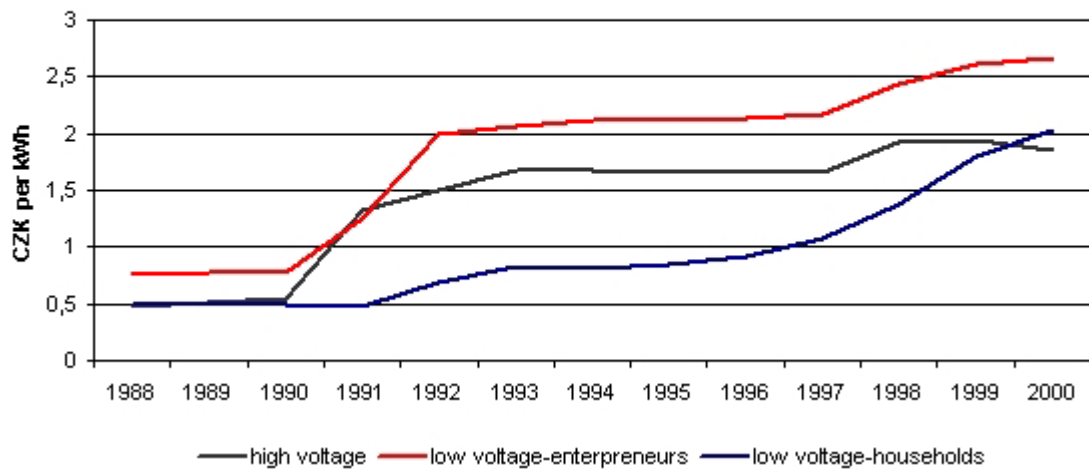
Source: Energy Regulatory Office, 2001 Annual Report on Operation of the ES Czech Republic, 2002

Electricity prices have more than trebled over the past decade primarily as a result of rising prices for previously subsidized input fuels. Within industrial sector, prices have been rising gradually after a very large initial adjustment. As for the household sector, substantial price rises have been more recent, related to pressures on removal of cross-subsidies. The government consequently implemented a series of tariff increases beginning in 1998 to bring household tariffs fully in line with costs by the end of 2002. In 2000 the household prices reached the level of industrial prices (Figure 12). A final increase of household prices by 9.9% on average on 1 January 2002 ensured prices reaching cost recovery levels.

VAT on electricity was introduced in 1993 at a reduced rate of 5% and increased to the full rate of 22% in 1998.

The cost of electricity production in the Czech Republic is relatively cheap. For coal-fired generation, variable costs range from as low as CZK 0.32/kWh for brown coal when the mine is next to the power plant, to CZK 0.55/kWh for hard coal. Nuclear power profits from low variable costs (around CZK 0.1135/kWh).

Figure 12. Electricity prices for industry and households in 1988-2000



Source: Energy Regulatory Office, 2001 Annual Report on Operation of the ES Czech Republic, 2002

3. Impact of the EU membership on electricity sector

3.1. Growth effects of the EU accession.

Demand side effects

The EU accession will entrain several, mostly indirect effects which might **boost the electricity demand**:

- an increase in consumption per capita related to a higher standard of living (e.g. a more frequent use of electric and electronic devices)
- an increase in potential market for Czech electricity producers, foreign demand for cheap (nuclear) Czech electricity
- a decrease in prices triggered by liberalization, integration of CEZ with distributors and adjustment of VAT down to the EU level (within the expected process of VAT unification)

On the other hand, the EU accession might lower demand through regulation and incentives aimed at **energy-saving and energy efficiency**. In this respect, the Czech Republic has a great potential.

In sum, it is expected that the first group of factors will prevail and consumption will rise. The Ministry of Industry and Trade forecasts an increase by nearly 12% to 58.8 TWh (4.7 Mtoe) by 2010. The share of electricity on total fuel consumption is expected to rise from 16.5% to 18.5%.

Supply side effects

On the supply side, the most visible effects of the EU accession are related to **liberalization**. The process of opening the market for competition should result in upward pressure on efficiency and downward pressure on prices. The **arrival of foreign investors** is supposed to further support efficiency gains in production and enhance R&D investment, it will also bring the domestic companies advantages in form of know-how, technologies and marketing skills, and possibly help to establish an access to the European market. In general, competition and FDI will improve the quality of services provided. This effect can be noticed today already in diversification of services (e.g. "Rainbow energy" offered by CEZ - products diversified for different type of consumer, for different season).

Another effect of the EU accession is related to the EU "**green acquis**". Adjustment to the EU standards has made electricity production considerably more expensive. The EU environmental objectives might also lead to a **change in the structure of sources**. The EU pressure to "improve" the energy-generation mix will most probably lead to a severe limitation or phasing-out of coal extraction and a decrease of the share of coal. However, the Czech Republic response to this EU pressure is only partial; the government does not fully accept the perspective of relying on foreign sources and prefers to concentrate on nuclear energy while keeping limited capacities for coal mining.

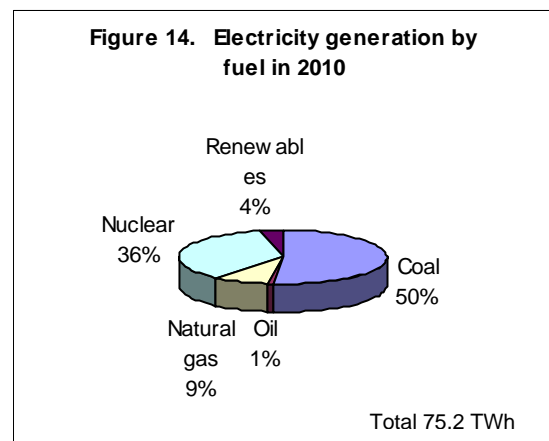
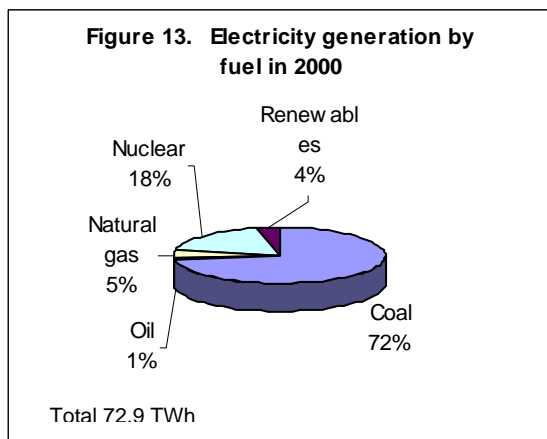
According to Deutsche Bank Research, the electricity production will increase by about 3% by 2010. Coal's contribution will fall by around 14 TWh or 21% (also with respect to efforts to converge with the EU environmental standards) and on contrary nuclear energy will deliver a further 13 TWh or 17% after commissioning of two Temelin blocks. The natural gas share in the electricity production will rise by 3TWh or 4% (natural gas will become a third pillar of the energy mix after coal and nuclear energy). The share of oil and renewable is expected to remain roughly stable over the period.

Table 6. Electricity generation by energy sources (in TWh)

	1990	2000	2010
Coal	44.9	52,9	38.6
Oil	3.0	0,5	0.8
Natural gas	3.6	3.4	6.4
Nuclear	12.6	13.6	26.7
Renewables*	1.4	2.6	2.6
Total (in TWh)	62,6	72,9	75,2

* includes hydropower, energy from waste

Sources: IEA/OECD, Deutsche Bank Research



Sources: Deutsche Bank Research

3.2. The effect of accession on foreign trade and evolution of net exports.

At the moment, the Czech Republic is the second biggest electricity exporter in the EU 25 (after France). After the accession, we can expect growth in trade with the EU countries due to a free access to the internal market. Trade will be also fostered by the current tendencies in the EU – the emphasis put by the European Commission on multiplication of interconnections within the internal market.

Export dynamics

The Czech electricity sector has competitive advantages in sense of low production costs (low labor cost, large share of nuclear electricity which has low variable costs). Under the conditions of surplus in production capacities the Czech electricity has good chances to capitalize its competitive advantage in gains from exports. After joining the EU, the export **opportunities will further augment** due to the following factors:

- full liberalization of international trade within the internal market which will guarantee equal conditions for electricity trade within the market (CEZ in its Annual Report points at the current state where foreign competitors have free access to the Czech electricity market while the access of Czech electricity to some neighboring markets is disadvantaged by a fee for cross-border transmission and auction prices for the export share capacity, or other discriminatory obstacles, such as administrative obstacles, subsidies for input prices or lower environmental, social or safety standards),

- an extension of potential destination market (opportunities exist especially in markets that have a structurally more expensive generation park),
- an increase in interconnections with the current EU Member States
- a decrease in electricity price as a result of liberalization, as well as of the planned integration of CEZ and distribution companies,
- the expected integration of CEZ with a successful and powerful actor in European electricity market (strengthening the capital position, profit from synergies and economies of scale),
- a large surplus of cheap electricity from nuclear sources after full commissioning of the nuclear power plant Temelin.

Limitations of electricity exports are seen in the current capacity surplus all in Europe which leads to low market prices. However, this surplus is expected to disappear in a horizon of five years (the steadily augmenting demand will level supply between 2006 and 2009), and then, the Czech Republic will be able to use its surplus from Temelin production. Another limitation lies in the expected wage growth towards the EU level which might eliminate a part of the Czech competitive advantage. However, production costs of the main exporting article – nuclear electricity – includes only a small share of labor costs.

Very important for the competitiveness of the Czech electricity will be the **development of the Czech crown's exchange rate** and the timing and method of its fixation to euro after the decision to join the EMU.

Import dynamics

Any more significant increases in imports of electricity are not expected. Electricity generation has been opened to foreign competition quickly and to a higher extent than in neighboring countries. Some distributors have already used the possibility to import electricity in an attempt to diversify resources away from CEZ. After the accession, the imports will be used, as today, to cover actual urgent needs. It is expected that the growth of domestic production capacity will limit the needs for imports to minimum. Imports might be further limited by negative reciprocity measures by the government.

To conclude, if the electricity producers join a strong strategic partner and continue their active trade policy and progressive expansion into new export territories, we can expect the competitiveness of Czech electricity will increase, **net electricity exports will rise** and the Czech Republic will strengthen its role of a net exporter.

3.3. The effect of accession on FDI flows.

FDI inflows

The first foreign investors entered the electricity sector through local **distribution companies** through purchasing the shares from local municipalities. Today, the most important foreign shareholder is German E.ON Energie, which owns shares in six companies and owns about 17% of total shares in distribution companies. Other foreign investors with significant holdings are German and Austrian utilities RWE, GESO, Energie AG Oberösterreich and Mitteldeutsche Energie Versorgung. It is expected that the acquisition of distribution companies will further proceed.

There has been also some foreign acquisition of capacity in the sector of **independent power producers**. Here, the interest came from the part of more distant investors: Cinergy (USA), International Power (UK),

United Energy, a subsidiary of the U.S. company National Fuel Gas, and Dalkia, a subsidiary of Vivendi and Électricité de France.

However, the largest FDI inflow is expected from the delayed **privatization of the dominant electricity producer CEZ**. Together with the share in CEZ, the state intends to sell its shares in distribution companies and the transmission system operator CEPS (see Privatization). After the failure of the first privatization plan, the timetable and method of privatization is not sure. The government assumes the earliest date for privatization could be 2004. Taking into account the considerable value of the privatized package, the winner-bidder can be only a European-strong investor, most probably a dominant actor of some of the larger national electricity markets within the EU.

In general, an easier access and increase in investor confidence is expected after the EU accession resulting in **a higher FDI inflow**. The advent of strategic investors is perceived as a part of the process of market concentration on European level. If foreign entrants act fast, they can leverage the skills and experience acquired during the liberalization of their home markets in order to pursue expansion opportunities in CEE markets.

In respect to FDI, a clear and stable energy policy of the government is of high importance. Some foreign investors have reportedly left the Czech energy market because of the constantly changing priorities of the energy policy. Therefore, the energy market players call for up-dated long-term (at least 30 years) energy policy.

FDI outflows

Until recently an outflow of investment seemed unlikely due to the relative capital weakness of Czech actors. However, after the “super-merger”, CEZ feels strong enough to announce its intention to expand to foreign markets also in terms of property. CEZ is interested mostly in Polish electricity distribution companies and Slovak incumbent Slovenske elektrarne.

3.4. Labor market effect of EU accession.

The EU accession will have effects on labor market primarily through the effects of liberalization. Both quantity and quality effects are expected. Migration of workers in the electricity sector – as well as in other sectors of the national economy – after opening of the EU labor market is unlikely.

Quantity effects

Expected development of employment is derived from the necessary restructuring of companies reacting to the new-born market environment. The necessity of rationalization of activities will result in a considerable decrease in employment in the electricity sector. On the other hand, employment losses from bankruptcies due to the competition pressure are not expected.

Transformation of **CEZ** from a generation-oriented towards business-oriented company will create new requirements for skills and qualifications, while the activities related to generation will be rationalized. The Ministry of Industry and Trade forecasts impacts on employment amounting to a decrease by 2970 jobs.

As for the **distribution companies**, the most visible impact of the liberalization might be a limitation of the number of customers and thus lowering of effects from electricity sales. Here also, a strong need for rationalization of activities will lead to employment losses. However, this trend might be partially outweighed by development of business with electricity for domestic as well as foreign customers. The Ministry of Industry and Trade expects employment in distribution companies to decrease by 1350 jobs.

A more profound prognosis of development of employment in electricity sector would need the knowledge of the timing and method of privatization of energy companies, especially in the case of purchase by a foreign partner. Experience with entrance of a **foreign partner** show that one of his first steps is to decrease the number of employees roughly by a third.

A „**Social pact**“, which is going to accompany every sale contract with a strategic investor, will moderate these impacts. The strategic investor will commit himself to extend intended job losses into a longer period while using „natural“ methods of disemployment, such as (early) retirement. It will not be possible under the Social pact to dismiss a worker with less than 5 years to retirement. For at least 5 years, the strategic investor will have to retain all employees in main working relation (including women on maternity leave and men in basic military service). Also, the investor will be obliged to maintain social conditions and real wage during the first 5 years, as well as social advantages included in collective agreements. Therefore, there should not be dramatic changes in employment or wages in the first 5 years after the signature of a contract with a strategic investor.

The government is going to transfer 3% of privatization gains to a new **Energy Privatization Fund** which will be used to preserve employment in the energy sector. The fund will provide released workers with financial compensations. Further, the government intends to initiate requalification schemes and support creation of new jobs (esp. in SME sector).

Table 7 shows predictions for number of employees of CEZ and distribution companies which are decisive for employment. By 2009, employment in these companies might decline by about 5000 employees compared to 1999 level, corresponding to 21%. Productivity of labor should increase correspondingly from average 3.4 to 5.5 GWh per worker.

Table 7. Average numbers of employees and productivity of labor – a prognosis

	Number of employees			Productivity of labor in GWh		
	1999	2004	2009	1999	2004	2009
CEZ	9 265	6 298	6 002	4,54	7,15	7,83
Jihoceska energetika, a.s.	1 189	1 030	927	2,77	3,30	3,98
Zapadoceska energetika, a.s.	1 443	1 300	1 290	2,63	2,96	3,03
Severoceska energetika, a.s.	1 805	1 575	1 550	3,55	4,31	4,50
Stredoceska energetika, a.s.	1 800	1 600	1 600	3,20	3,75	4,10
Vychodoceska energetika, a.s.	2 120	2 060	2 010	2,81	3,86	4,24
Severomoravska energetika, a.s.	2 097	1 875	1 860	4,81	4,73	4,75
Jihomoravska energetika, a.s.	2 339	2 146	2 089	3,16	3,72	4,19
Prazska energetika, a.s.	1 400	1 256	1 080	3,14	3,76	4,95
Total / Average	23458	19140	18 408	3,4	4,17	5,5

Note: As for CEZ, the prognosis is given for 2005 and 2010.

Source: Ministry of Industry and Trade

The number of released workers might further increase as a result of phasing-out of coal power plants. According to catastrophic scenario, the EU accession might indirectly lead to a release of as much 30 000 workers in the **coal sector** (extraction and energy generation).

Quality effects

As mentioned earlier, the liberalization of the electricity market, together with vertical disintegration and increased competition will pose new challenges for human resources. A higher productivity of labor will be required, as well as new skills and qualifications (especially in finances, legal service, risk management and marketing). In an open market, a strong emphasis will be put on need for human resources investments.

3.5. The effect of EU accession on the regulatory framework.

Here, the impact of the EU membership is most visible. The electricity sector in the Czech Republic showed considerable persistence: a decade of transformation was not sufficient to bring a new wind of liberalization in the sector. It was only the perspective of the EU membership what gave the decisive impetus for a change.

Since the regulatory framework must be compatible with the EU legislation at the moment of accession, most effects are already in place. The current regulatory framework is given by the **Energy Act** from 2000, which was designed to align the Czech legislation with the *acquis* in particular with regard to the internal energy market (directives on electricity, price transparency, electricity transit, non-discriminatory access to energy sources and state aid). Further, there were alignments in the area of nuclear energy *acquis* and environmental *acquis*. The Energy Act was accompanied in 2000 and 2001 by numerous implementing decrees (decrees of the Ministry of Industry and Trade and Energy Regulatory Office on the organization of the electricity market, both for eligible and captive customers, the construction of and access to the electricity and gas network infrastructure, the cost and revenue calculation for utilities, licensing rules, provisions for emergency states and co-generation.)

Liberalization

The 2000 Energy Act provided for a progressive liberalization of the electricity market: a free access to the networks and generation, free choice of electricity supplier, a shift to cost-reflective pricing (immediately for wholesale prices, and in the longer-term for retail prices) and end of cross-subsidies.

In order to encourage trade and investments exchanges from neighboring Austria and Germany, the Czech Republic opted for the same model of access to the networks: **the regulated third party access model**. Access to the networks has been guaranteed to all generators over 10 MW since 2002, and all generators since 2003. **Entry into generation** was liberalized in 2002, to a higher degree than in neighboring markets. The Ministry of Industry and Trade is responsible for **authorization of new generating capacities**. A **licensing system** is introduced for regulating the activities of all electricity market players (except consumers).

As for **end-users**, the timetable of liberalization is the following:

- 1 January 2002: 30% of the market (66 major end-users consuming more than 40 GWh)
- 1 January 2003: 40% (400 consumers above 9 GWh)
- 1 January 2005: 50% (30 000 consumers above 0,1 GWh)
- 1 January 2006: 100% (5 million end-users).

At the moment, a dispute has arisen among energy policymakers over whether and how the Czech Republic should respond to European Union moves for power markets to be opened faster. There is a strong opinion (especially within the ERU) that the new energy act, which is to be prepared by the end of March, should respect the deadlines that appear in the new EU directive of November 2002. This would mean opening of electricity market for all customers, except households, by July 2004 and by July 2007 for everyone. However, the Ministry of Industry and Trade insists that even meeting the existing Czech timetable will present an array of problems, many of them technical.¹⁰ An adjustment to the new EU timetable would, according to the Ministry, further complicate the situation. In fact, an adjustment to the EU timetable would mean an acceleration of liberalization of 30 000 consumers by six months, but at the same time, a postponement for 5 million consumers by a year. In sum, the EU timetable is less pressing.¹¹ If the Czech government does not recognize this fact and decides not to fall into line with the new EU liberalization timetable, it must face the prospect of being forced to do so when it enters the EU.

The Energy Act stipulated an **adjustment of prices and tariff structure** by 2002 in order to remove cross-subsidies and allow for cost-reflective prices. A final increase of household prices by 9.9% on average on 1 January 2002 ensured prices reaching cost recovery levels.

Some effects of liberalization are already visible. The first stage of liberalization led to a **reduction in electricity prices** by approximately 6-10% in 2002. Further 7-9% decrease is expected in 2003 as liberalization proceeds. For example in Germany, the price for the biggest customers dropped by 30%. However, some experts question the sustainability of this phenomenon – in struggling for customers, distribution companies sometimes make offers under the profitability threshold. It is therefore possible that prices will rise after the market has been divided (see the experience of western liberalized electricity markets). Another factor for prices to sink is the super-merger. CEZ already announced a 5% decrease in prices offered by distribution companies under its control.

As for the free choice of supplier, it is expected that consumer's approach towards free choice of supplier will be restrained at the beginning and will evolve only gradually. The first year of liberalization, with approximately 80 authorized customers, did not see any essential changes of supplier. However, in 2003 when roughly 450 customers acquired the right to choose a supplier, the market experienced a real

¹⁰ One of the biggest of these will be the installation of meters to measure electricity and gas consumption. Installing these measuring instruments will be demanding as regards time and money (if we take the take the cost of each one at CZK 3,000-4,000, then the total bill could be €500 million-700 million).

¹¹ The government rejected on 9 January 2003 a proposal to bring forward the current liberalization deadline for consumers of over 100 MWh a year to 2004. Similar proposals to speed up the timetable are expected to be made by MPs in the lower house of Parliament.

earthquake. The most successful in luring new customers were foreign-owned distribution companies JCE and JME.¹²

A new definition of basic market institutions

Following the 2000 Energy Act, **the Energy Regulatory Office (ERU)** was established on 1 January 2001 as a new institution to perform regulation in the energy sector. In relation to that, a redistribution of power happened to delegate some responsibilities of the Ministry of Industry and Trade and the Ministry of Finance on the new regulatory body.

In January 2002, **Electricity Market Operator (OTE)** became operational, majority-owned by the government, to replace the Central Dispatch Center (UED). It is responsible for organizing/operating the short-term electricity market, operating a financial settlement system for that market, and providing electricity balances for system operation to the TSO, forecasting demand and supply. Since its establishment, the short-term market for electricity trading has struggled to build enough trading volume. It considers cooperation with the neighboring markets.

Nuclear energy acquis

The regulation of electricity production from nuclear sources is given a good deal of attention by the EU: about an half of the space in Commission's reports on the whole energy sector is devoted to nuclear energy.

The EU legislation on nuclear energy today comprises a framework of legal and political instruments, including international agreements. It currently addresses issues of health and safety (including radiation protection), safety of nuclear installations, management of radioactive waste, investment, promotion of research, creation of a nuclear common market, supplies, safeguards and international relations. The accession to the EU means for the Czech Republic a commitment of permanent care for nuclear and radiation safety. This commitment includes a necessity to ensure compliance with EURATOM requirements and procedures, in particular with regard to Euratom safety checks, up-grading of nuclear power plants, safe management of spent fuels and radioactive waste, acceptance of irradiation limits. Most necessary adjustments were solved by the amendment of Atomic Act No. 18/1997 from December 2001, which came in force on 1 July 2002.

"Green acquis"

Environment-friendly production and use of electricity is one of the basic objectives of the European Union. In order to comply with the EU legislation, the Czech Republic must adopt measures both in electricity production and consumption. On the side of production, most important are **modernization of coal power-plants** (desulphurization, denitrification), reorientation on renewable energy sources, and measures to increase energy efficiency. The first task has been already carried out during the 1990s; the Czech coal power plants were desulphurized most quickly in Central and Eastern Europe and now they fulfill entirely strict environmental standards comparable to the EU.

As for **reorientation on renewables**, the Czech performance is much less impressive. The Czech energy policy states that renewables cannot be considered as any substantial source of energy (further development of certain renewables is limited by climate and geographical conditions – wind and solar energy, hydro-power). If renewable sources should play any considerable role, it will be at regional and local levels (mainly biomass, small hydropower stations).

¹² It is assumed among the observers that E.ON, who owns majority in these companies, opted for a drastic strategy (contracts on a merge of profitability) in expecting the creation of Super-CEZ and subsequent severe battle for market shares.

The EU target of 12% of energy consumption from renewable sources in 2012 is unrealistic for the Czech Republic. The Ministry of Industry and Trade aims to increase the share of renewables from the current 1,5% to about 3-6% in 2010 and 4-8% in 2020. The increase up to 6% would require about € 9,5 billion of investment by 2010.

On the side of consumption, the EU membership commits the Czech Republic to modify consumer's rights and duties in order to encourage **energy savings** and increase **energy efficiency**. With the perspective of the EU accession, the Czech Republic has taken up a commitment to formulate a national programme for energy savings. The government adopted the first Annual State Support Programme for Energy Saving and the Use of Renewable Energy Sources. Since 2002, the annual programmes are based on the multi-annual National Programme for Economic Energy Management and Use of Renewables. Besides, following the 2000 Energy Act, generators of electricity from CHP and from renewable sources have a priority access and the right to sell their electricity to the local distributor. Also, a direct aid is allowed in the case of renewables and energy savings (subsidies per kWh, fixed purchase price, green certificates, quote schemes, etc.)

Although the energy intensity has decreased considerably since 1990s, there is a lot of space for further improvements. However, they are hindered by a lack of finances. According to the assessment of the Ministry of Industry and Trade, full utilization of hypothetical potential for energy savings (30%) would require expenditure of € 41 billion. The State Programme on Energy Saving and Use of Renewable Sources, is endowed with limited resources, dependent on the availability of funds from the national budget. State funds supporting projects in favor of energy-saving are being reduced every year (in 2002 € 2.5m corresponding to one-quarter of the 1999 figure). On the contrary, funds aimed to encourage the use renewables are increasing. Environmental investment in all energy sources in the Czech Republic has so far required about € 3 billion (almost half of it in CEZ).

In this relation, hopes are made in relation to the EU membership. First, the Czech Republic will gain access to numerous programmes in support of energy savings and renewables (SAVE, Sixth Framework Programme for R&D, ALTENER, SYNERGY, Cohesion Fund) and renewables (including assistance from the Structural Funds). Second, the Czech Republic will be able to use financial gains from the envisaged trade with green-house gas emissions.

Compliance with the EU *acquis*

Despite a great legislative effort, a few problems still remain in respect to the compatibility with the *acquis communautaire*. The most problematic issues from this point of view are:

- access to storage facilities – it is not guaranteed in the Czech legislation,
- license regime - licenses are awarded not the basis of fulfillment of pre-defined conditions, but on the basis of a decision of the regulator,
- absence of a clear and sufficiently detailed definition of serious economic and financial difficulties with take-or-pay contracts (compatibility with the EU competition law).

An amendment to the Act is being prepared by the Ministry of Industry and Trade at the moment and it can possibly align the above-mentioned incompatibilities with the *acquis*.

3.6. The effect of accession on market structures

The market structure, as the whole electricity sector, remained very much unchanged until recently. The state-owned company CEZ dominated generation and transmission, local distribution companies profited from their regional monopolies, while the state divided revenues between CEZ and distributors by regulation.

As a result of alignments to comply with the EU legislation, many changes occurred with a strong impact on the market structure. Above all, **transmission was separated from generation**: the transmission system was separated from the generating company CEZ in formal terms by creating CEPS in 1999 (100% subsidiary of CEZ at the moment, to be sold to the state). The Energy Act stipulated creation of **new market actors**: Electricity Market Operator and Energy Regulatory Office (see the previous part 3.5.). Also, the Energy Act opened the door for **competition** at all levels of electricity market. In the first period until 2005, electricity market will be opened only within the Czech Republic (generation and imports in 2002, supply to end-customers gradually by 2006), and from 2005, it will be opened also for foreign competitors. The domestic electricity companies are expected to use their outstanding advantages (competitive costs, thorough knowledge of the market) to maintain their positions in the Czech Republic. Their position should be strengthened also by a suitable mode of privatization, with a possibility of cooperation with a strong partner in the European market.

At the moment, electricity companies are making effort to adjust to the accelerated development in the sector given by the process of adoption of the EU *acquis*. Most of them are undergoing **transformation and rationalization of activities in order to be better prepared for competition**. For example, CEZ is transforming from a primarily generation-oriented towards a business-oriented company. This generates a need to develop new market skills (pricing, risk management, marketing and PR activities). Organizational structure is reformed to give the company a transparent management, special emphasis is put on economizing measures, cost-efficiency, quality and diversification of services. CEZ lowered its prices compared to 2001 (not so much as a result of economizing, but a decrease in production costs due to the commissioning of Temelin). CEZ is convinced to be able to stand the competition in the Czech Republic even without a strategic partner and has already prepared a strategy adjusted to that scenario. CEZ believes restructuring of the company is the first step towards creation of a strong energy group in Central Europe and will allow for alliances also with partners outside the region.

In 2002, in order to prepare the sector for the up-coming competition from the EU and after the failure of the privatization plan, the government decided on an acquisition of state's shares in eight regional electricity distribution companies by the joint stock company CEZ (see Chapter 2.5. From privatization to super-merger). This initiative was closely observed by the EU since it would constitute a **vertical integration of generation and supply** of electricity on the Czech markets and also **horizontal integration of the distributors** (see a Parliamentary question by the MEP Ward Beysen to the Commission about the compatibility of the transaction with the *acquis communautaire* of 25 November 2002).¹³ The European Commission examined the planned concentration from the point of view of competition rules, state aid and competitive advantage for the Czech Republic, however, its opinion could not go behind its powers: "The concentration ... is subject to the jurisdiction of the Czech competition authorities." As was said before, the Czech Antimonopoly Authority approved the transaction under the condition that CEZ must sell three minority-owned and one majority-owned distribution company. As a part of the transaction, CEZ must sell 66% of the transmission system CEPS to the state and 34% to another subject with no connection to CEZ. Thus, separation of transmission from generation is ensured also in property terms.

¹³ As a result, the new CEZ-Group would control more than 70% of the generation and 2/3 of the national electricity supply. The decision of the Antimonopoly Authority limited the CEZ's acquisitions to 70% of generation and almost 50% of supply.

On the other hand, where the EU acquis must be respected are the existing activities of distribution companies. The requested **separation of distribution and business activities** has been done only in accountancy terms. Since the EU considers this form of separation insufficient, there will have to be a change after joining the EU: it won't be possible for distribution companies to possess licences both for distribution and business within one legal entity.

According to many liberal economists, the new Energy Act, while bringing the wind of liberalization and competition, maintained conditions for an oligopolist market structure.

4. Conclusions

4.1. SWOT analysis

Let's now summarize the strengths and weaknesses of the Czech electricity sector in the perspective of the EU accession, as well as costs and benefits of the EU accession for the electricity sector in the Czech Republic:

STRENGTHS
<ul style="list-style-type: none">▪ Low production costs, low electricity prices▪ Qualified labor force▪ Security of supply of electricity-production sources – low dependency on imports▪ High profits
WEAKNESSES
<ul style="list-style-type: none">▪ Enduring link between the dominant producer CEZ and the state policy▪ Staggering privatization▪ Unstable governmental energy policy▪ Small trading volume of the Electricity Market Operator
OPPORTUNITIES (BENEFITS)
<ul style="list-style-type: none">▪ “Forced” liberalization of the electricity market ⇒ end of monopolies, competition, transparency, efficiency, lower prices▪ Access to the EU electricity market▪ Growth of the electricity sector - higher electricity demand covered by higher domestic production▪ Growth of electricity exports▪ Arrival of foreign investors ⇒ capital strength, higher productivity of labor, know-how transfer, improved quality of services▪ Gains in energy saving and energy efficiency▪ Possibility to use the EU funds and programmes
THREATS (COSTS)
<ul style="list-style-type: none">▪ Disemployment in the electricity sector▪ Compliance with green acquis and nuclear safety legislation▪ Costly arrangements in support of energy saving and energy efficiency, reorientation on renewable energy sources▪ Pressure to “improve” the energy-generation mix in favor of natural gas and oil and to the detriment of coal ⇒ increased dependency on energy-imports

4.2. Recommendations for short-term policy measures

The Czech government faces several challenges in relation to the up-coming EU accession. Some measures are necessary in order to ensure a smooth functioning of the new-born market. Other steps are advisable in order to adopt the European policy standards. Governments will have to make careful trade-offs between three conflicting factors: first, the need to ensure a stable free market environment that minimizes end user prices; second, the need to minimize the social costs of such a move; and third, the need to maximize the privatization proceeds from the sale of utilities still in state hands. When doing so, they should make sure that they create a market that is competitive but also sufficiently attractive for the players.

- First of all, the energy policy should contribute to a **stable and clear environment**. However, the industry in the Czech Republic is heavily criticizing the energy policy of the government, mainly because of the absence of sufficiently clearly defined objectives of the Czech energy policy and energy sources mix. As mentioned before, some foreign investors have reportedly left the Czech energy market because of constantly changing priorities of the energy policy. Therefore, the energy market players call for **up-dated long-term energy policy** (at least 30 years).
- This objection should be reflected in the currently prepared amendment to the energy act. Through this amendment, the policy-makers have an opportunity to **remove the remaining incompatibilities** between the EU and Czech legislation, including the harmonization of the liberalization timetable with the new EU directive (see chapter 3.5). The longer the liberalization process, the longer will exist new-age cross-subsidies (distributors selling electricity to eligible customers on the edge of profitability, while seeking profits in sales to captive customers, i.e. households).
- It is necessary to **strengthen the capacity of regulatory bodies**. A further strengthening of financial and human resources of Energy Regulatory Office, which are currently far lower than originally planned, is urgently required to ensure adequate regulation of energy markets in line with their progressive liberalization. The Electricity Market Operator will need to be upgraded substantially in line with increased market liberalization. The State Energy Inspectorate has not yet received additional financial and human resources, to reflect the new responsibilities transferred to it in 2001-2002, thus resulting in weak enforcement capacities.
- It is advisable to **proceed with the privatization** of CEZ and regional distribution companies. There is a risk that the deferment of deadlines for privatization will compromise the readiness of privatized companies for market liberalization measures already planned. Transparency and openness must be ensured during the ongoing electricity utilities restructuring and privatization process. Privatization of CEZ could finally weaken the links between CEZ and the government.
- The state should take up measures to **prevent fictive electricity exports** (see Footnote 3).
- In the field of **nuclear energy**, the state-owned CEZ should finalize the nuclear plant Temelin and continue with modernization of Dukovany. Nuclear safety surveillance should be up-graded under cooperation with EU experts and continue diplomatic negotiation with neighboring countries to clear the disagreement points on Temelin¹⁴. The EU Status Report published in June 2002 concludes that the Czech Republic has accepted and addressed all the recommendations contained in the Report on Nuclear Safety in the Context of Enlargement of June 2001. However, the Czech Republic is expected to ensure that they the indicated

¹⁴ In November 2001, the Heads of Government of the Czech Republic and Austria, using the good offices of the European Commission, concluded the Melk Process with an agreement on follow-up measures, in particular as regards nuclear safety issues. During the process, the Czech authorities voluntarily undertook an environmental impact assessment of the Temelin Nuclear Power Plant.

measures are implemented. Longer-term solutions for nuclear waste have to be defined. The government should ensure safe management of spent fuels and find new storage sites for radioactive waste.

- Further measures are required to improve energy efficiency. The actual programmes in support of energy saving and use of renewable energy sources are ineffective, and moreover, the state funds for these projects are diminishing year by year. A higher political priority should be given to this issue by the government.
- The government should proceed with restructuring of the coal sector. The EU has repeatedly criticized little progress in this direction. In 2001 demand for brown and hard coal remained stable after a slight increase in 2000. In fact, restructuring of the coal-sector is closely connected to the restructuring and privatization of the electricity industry.
- The Czech Republic should make effort to participate in the formation of the EU energy policy (e.g. European Commission's advisory boards for nuclear safety). The Czech Republic is strongly criticizing the small involvement of the candidate countries in preparations of the new EU legislation (new impetus by Barcelona summit).

4.3. Final remark

As a final remark, it is appropriate to say that according to the European Commission's final Regular Report on the Czech Republic's progress in preparation for the EU accession, "the Czech Republic is generally meeting the commitments it has made in the accession negotiations in this field". The negotiation chapter on energy was closed on 12 December 2001.

Due to the objective of the EU accession, the Czech Republic enters the family of European countries with liberalized electricity markets. Although we tried to envisage the possible impacts of the EU accession on the electricity market, only time will show how the Czech electricity sector can cope with the major challenges ahead.

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