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The Expected Effects of the EU Accession on the Electric Energy Sector in the Slovak Republic

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Table of Contents

<i>Table of Contents</i>	2
<i>Introduction</i>	3
<i>Transformation and Privatization of the Slovak Electric Energy Sector</i>	4
Stranded Costs	9
Liberalization of electricity market in Slovakia	11
<i>Growth effects of EU accession on the electric energy sector</i>	16
Effects on the production of electric power	16
Effects on the consumption of electric power	19
Factors influencing the consumption of electricity	22
<i>Effects of accession on foreign trade and evolution of net exports</i>	26
Volumes of export, imports and their prognosis	27
<i>The effect of accession on FDI flows in the electric energy sector</i>	31
Liberalization of Slovak electricity market attracts foreign investors	31
CCGT power station in Malzenice	31
CCGT plant Paroplynovy cyklus Bratislava	32
<i>Labor market and EU accession</i>	33
<i>The effect of EU accession on the regulatory framework</i>	36
<i>The effect of EU accession on the market structures</i>	41
<i>Generation capacities of SE</i>	48
Nuclear power plants	48
Conventional (thermal) plants	48
Hydroelectric power plants	48
<i>Performance of the electric energy sector</i>	49
<i>Short-term policy measures related to the electric energy sector</i>	50
<i>Appendix</i>	52

Introduction

The electric energy sector in Slovakia has been experiencing major changes in recent years. Slovakia started EU accession negotiations in March 2000. The accession process should culminate in May 2004, when Slovakia joins the EU. The successful conclusion in 2002 of pre-entry negotiations for the "Energy" chapter was conditioned by the implementation of steps leading to the transformation and liberalization of the electric energy sector in Slovakia. In 2001 the Slovak government began the restructuring and privatization of the three regional distribution companies, and subsequently also the dominant electricity producer in Slovakia – Slovenske elektrarne. The major objectives of the liberalization of the electricity market are threefold: preparation for integration to the single energy market in the EU, security of energy supply, and sustainable development. The energy strategy of Slovakia stems from principles embedded in EU Directive No. 96/92 on the internal energy market.

One of the prerequisites for the liberalization of the electric energy market is so-called unbundling, which is the separation of the generation, transmission and distribution of electricity. Unbundling and the establishment of an independent regulatory framework will enable the creation of a non-discriminatory and competitive environment. The basic principle of liberalization is the freedom to generate electric power, and transmit such power via existing transmission and distribution systems, on a non-discriminatory basis. However, the electric energy market can never be liberalized to the same extent as commodity markets because the transmission and distribution networks are so-called natural monopolies. In practice, a liberalized electricity market means one featuring competition among independent power producers that have free access to the distribution network. Thereby liberalization requires the creation of an independent regulatory framework which ensures that the same conditions apply for all regulated subjects.

The Slovak government is obliged to adopt and implement all these principles as a result of the EU accession negotiations that were successfully concluded in October 2001. Minority stakes in the three distribution companies have already been acquired by major European players, while the privatization of Slovenske elektrarne is still in progress (due for completion in 2003). Since the Slovak government did not apply for any transition period, the electricity market will be fully liberalized for businesses in 2005, which is later compared with current EU members. At that time all enterprises and electricity distribution companies will have the right to choose their electricity supplier, and they will be able to import the electric power from abroad without any limits.

Both the integration of the Slovak internal electricity market into the single EU market and the market liberalization will have a significant impact on the domestic production of electric power, foreign trade, regulatory framework, the labor market, and market structures. These processes were kicked off as part of the EU entry negotiations. Therefore, when evaluating the expected effects of EU accession on the Slovak electric energy sector, we not only assess the impact on the single entry date, but also assess the impact of the entire process comprising of the various steps towards the liberalization of the electricity market which started in 2000 and which should conclude in 2005.

Transformation and Privatization of the Slovak Electric Energy Sector

On September 27, 2001 the Slovak government approved the model of transformation and privatization of the electric energy sector. The aim of this model is to create a fully liberalized and competitive environment in the electricity market. The process is defined in the document "Energy policy of the Slovak Republic" as well as in the amended Law on Energy No. 70/1998. The policy's main goals include preparation for integration into the single EU energy market, security of energy supply, and permanently sustainable development. Further, the prerequisite main areas towards the creation of a competitive and liberalized electricity market were identified:

- restructuring and privatization of companies in the electric energy sector,
- establishment of an independent regulatory body,
- deregulation of electricity prices and removal of cross-subsidies.

Besides these main steps, the government needs to adopt further legislative norms to comply with EU directives. An amendment to the Law on Energy is already being prepared by the Ministry of Economy, the regulatory body, as well as by the regulated companies in the sector. Prepared legislation will also facilitate the establishment of an independent system operator in the electricity market, and help create an environment for electricity trade on the open market. Other laws that are to be adopted, include the Law on Energy Efficiency and the Law on Rational Use of Energy.

Unbundling started in the early 1990s

The basic prerequisite for the liberalization of the electricity market is so-called unbundling – the separation of the generation, transmission, and distribution of electricity. The first step towards unbundling was implemented in the early 1990s when the former state utility Slovensky energeticky podnik, s.p. was divided into the dominant producer Slovenske elektrarne and three regional distribution companies (ZSE, SSE, VSE). Interestingly, the representatives of Slovenske elektrarne complain that the unbundling was not implemented properly. They say the distribution companies in Slovakia also operate 110 kV lines, which are a part of transmission grids in other countries.¹ The process of unbundling was concluded in 2002, when the transmission grid, as well as activities not related to the generation or distribution of electricity (e.g. heating plants), were separated from the distribution companies and Slovenske elektrarne. The aim of unbundling was to create a transparent environment in the electricity market and to remove cross-subsidies and other undesirable obstacles of competition. Generally, there are three possible ways to carry out unbundling – legal, managerial, and accounting separation. The Slovak government has chosen the legal separation of the generation, transmission and distribution of electricity, the preferred option for most EU countries. Managerial or accounting unbundling is more appropriate in countries where horizontally integrated public utilities exist because of greater synergic effects for customers. An example of managerial unbundling is Germany where the largest public utility E.ON is active in the generation, transmission and distribution of electricity, and which supplies its customers with electricity, gas, water and heat.

Transformation of Slovenske elektrarne and the distribution companies

The three state-owned distribution companies were transformed to joint stock companies at the end of 2001. Prior to their partial privatization, local heating plants were separated from the distribution companies to form independent companies (still state-owned). In January 2002 the dominant producer of electricity Slovenske elektrarne (SE) was transformed to a joint stock company with a 100% stake owned by the state.

¹ EU Directive No. 96/92 defines that distribution means the transport of electric energy in low and middle voltage lines (with voltage up to 45 kV) with the purpose of supplying consumers.

At the same time, the transmission grid was separated from SE to form an independent company called Slovenska elektroenergeticka prenosova sustava (SEPS) j.s.c. In a similar manner, a heating plant in Kosice was separated to form Teplaren Kosice j.s.c. At present, SEPS owns all 220 kV and 400 kV electric lines in Slovakia, together with some transformer stations, and Slovak electric energy dispatching, which regulates the optimal functioning of the Slovak transmission grid. SEPS should remain in the ownership of the state. SEPS operates high-voltage electric lines and it ensures the interconnection of the Slovak transmission grid with the grids of neighboring countries. The privatization of the three distribution companies was completed in 2002, while the privatization of SE started in August 2002 and should be completed by the end of 2003, although some delays are likely anticipated.

Economy minister Robert Nemcsics considers the option of privatizing the Czech and Slovak electricity producers together

The planned sale of Slovenske elektrarne, currently at the stage of preliminary bidding, might be changed. According to economy minister Robert Nemcsics, the submitted preliminary bids might not meet the cabinet's expectations regarding privatization revenues. Thus the Economy Ministry has not excluded the possibility of privatizing the Czech and Slovak electricity producers together. However, this would require a new tender and privatization conditions. The Slovak cabinet has not discussed this possibility with its Czech counterpart as of yet. Robert Nemcsics, though, emphasized that the idea of privatizing the Czech and Slovak electricity producers together is only a thought and that he does not doubt the current privatization tender.

Table 1
Transformation of Slovak companies in the electric energy sector

Prior to transformation	After transformation	Area	Date of establishment	Share for privatization
SE, s.p.	Slovenska elektrarne, j.s.c.	generation	Jan 21, 2002	49%
	SEPS, j.s.c.	transmission	Jan 21, 2002	0%
	Teplaren Kosice, j.s.c.	heating plant	Jan 21, 2002	49%
ZSE, s.p.	Zapadoslovenska energetika, j.s.c.	distribution	Oct 31, 2001	49%
	Bratislavska teplarenska, j.s.c.	heating plant	Nov 1, 2001	49%
	Trnavska teplarenska, j.s.c.	heating plant	Nov 1, 2001	49%
SSE, s.p.	Stredoslovenska energetika, j.s.c.	distribution	Jan 1, 2002	49%
	Martinska teplarenska, j.s.c.	heating plant	Jan 1, 2002	49%
	Zilinska teplarenska, j.s.c.	heating plant	Jan 1, 2002	49%
	Zvolenska teplarenska, j.s.c.	heating plant	Dec 31, 2001	49%
VSE, s.p.	Vychodoslovenska energetika, j.s.c.	distribution	Dec 21, 2001	49%

Source: Ministry of Economy of the Slovak Republic

Privatization of electricity distribution companies

The privatization of the three distribution companies took place in 2002. The state offered 49% of stakes for sale in Zapadoslovenska energetika (ZSE), Stredoslovenska energetika (SSE) and Vychodoslovenska energetika (VSE). The intended entry of foreign strategic investors should ensure the further development of the companies, introduce know-how, and increase the competitiveness of the Slovak electric energy companies in the single EU energy market. Potential investors had to give an obligation to purchasing the remaining 51% stake of the state in the distribution companies should the state decide to sell such a stake in the coming six years. Almost 30 companies participated in the tenders, although just a few submitted

binding bids. The most lucrative acquisition target was ZSE, which is the largest Slovak distribution company with more than 800,000 consumers and total assets of EUR 250m. The German group E.ON Energie, which offered EUR 330m for the 49% stake, acquired ZSE. The new owner of SSE became Electricité de France. It paid EUR 158m for the 49% stake. The smallest distribution company – VSE - was acquired by the German company RWE Plus for EUR 132m.

Table 2
Basic data of electricity distribution companies in Slovakia for 2001

Indicator		ZSE	SSE	VSE
Supplied area	km ²	14,928	18,791	15,746
Useful supply of electricity	GWh	6,779	6,531	4,079
Length of electric lines	km	33,982	31,438	19,722
Number of consumers	#	824,912	686,009	637,131
Number of employees	#	2,612	2,588	2,025

Source: ZSE, SSE, VSE

At present, the government is considering the sell-off of its remaining stakes in the distribution companies. We believe the cash-strapped government will sell the stakes during this term, as it needs resources to finance the planned pension reform.

Restructuring and privatization of Slovenske elektrarne

SE was transformed into a joint stock company in January 2002. Prior to the transformation, the transmission grid and heating plant Teplaren Kosice had been separated, forming two joint stock companies—Slovenska elektroenergeticka prenosova sustava a.s. (SEPS) and Teplaren Kosice a.s. The state-owned SEPS became the owner and operator of the transmission grid, which is currently connected with the transmission grids of all surrounding countries except Austria. After the completion of the privatization of the three distribution companies, the government triggered the privatization of SE in August 2002. Potential investors for a purchase of the 49% stake in SE included major international players like E.ON, RWE, Electricité de France, Enel, Iberdrola, British Energy, and International Power. All of them have already submitted preliminary offers. The European Bank for Reconstruction and Development and the International Finance Corporation (the investment division of the World Bank) also showed their willingness to take part. No American energy company participated in the privatization tender; nowadays they tend to focus on debt reduction rather than on expansion into emerging markets. On the basis of preliminary offers, the privatization committee should prepare a short list of 4-6 potential investors, each of which will be able to perform due diligence in SE. The final verdict will depend on the comparative analysis of financial benefits for the state from SE's dividends or the privatization of the majority stake in SE².

E.ON	British Energy
RWE	International Power
Electricité de France	EBRD
Enel	International Finance Corporation
Iberdrola	

² At present, the privatization of majority stakes in so-called strategic state companies is forbidden by the Privatization Act. Thereby, parliament's approval of a change in the Act must precede any sale of a majority stake in SE or distributors.

Potential investors have two alternatives

The government of Slovakia has offered potential investors the possibility to choose one of two alternatives – either the privatization of SE as a whole, or the division of SE into two companies (one with nuclear assets and the other with hydroelectric and thermal power stations) and their subsequent privatization. In either case the Gabčíkovo hydroelectric power station is not to be privatized because the agreement between Slovakia and Hungary (signed in 1977) on the construction of the Gabčíkovo – Nagymaros dam does not allow the privatization of the assets of the Gabčíkovo dam. According to the privatization advisor, PriceWaterhouseCoopers, all potential investors prefer the alternative of the division of SE into two separate companies. None of the investors showed any interest in the nuclear assets (Jaslovské Bohunice and Mochovce). They are reluctant to invest in Soviet-type nuclear power stations and are unwilling to handle stranded costs in SE's nuclear power stations. Due to the lack of interest in privatizing nuclear assets, the privatization advisor suggests keeping the nuclear power stations in the ownership of the state and to lease them to potential foreign investors.

Lack of interest in acquiring nuclear assets–

The privatization of SE is opposed by several groups. One line of argument, backed by some elements inside SE, is that the division of SE into two companies may jeopardize the technological functioning of the Slovak electric energy industry. SE technical director, Andrej Hanzel, says that the particular generation facilities in SE supplement themselves and keep the grid in balance. The opinions of SE's managers may be, however, determined by their own vested interests. The fact is that the division of SE should result in greater competition in the Slovak electricity market. Another line of argument points at SE's poor financial standing, the result of the state's delayed price deregulation. The major problem of the SE privatization is the so-called stranded costs³ that SE inherited from huge state investments and some inappropriate contracts over the past decade. The capital outlays were financed by credits with state guarantees, which caused an increase in SE's debt. Electricity prices, which were slowly deregulated in the 1990s, did not generate sufficient sales and profits to cover high financial costs. In 2001, the sum of long-term credits comprised about 40% of total assets and financial costs accounted for 25% of all costs. The lack of foreign investor interest in privatizing SE's nuclear assets stems mainly from the fact that most of the stranded costs are tied up with nuclear assets. Thus, the method by which SE is compensated for the stranded costs is crucial for any successful privatization. The method is yet to be determined by the office for state assistance (USP) and the government. In 2002, SE calculated the amount of stranded costs at EUR 1bn (see Table 3). However, the supervision body for network industries, URSO, did not accept this calculation of stranded costs and it included in the regulated system charges for 2003 only the following stranded costs of SE:

- SE contract with a CCGT operator, Paroplynový cyklus, j.s.c., on the purchase of generated electricity
- SE contract with a mining company, Hornonitrianske bane Prievidza, on the supply of brown coal, which resulted from the government's obligation to generate up to 10% of electricity from domestic coal resources
- SE legal contributions to the state fund for the decommissioning of nuclear-energy facilities

³ *Stranded costs* include commitments and guarantees as items of stranded costs, if there is a cause-effect relationship between the opening of the market, a fall in electricity price or market share, and losses from compliance with these commitments and guarantees. In other words, stranded costs are such costs that significantly limit the competitiveness of an electricity producer. They may relate for example to the non-utilization of production, transmission or support capacities, as well to non-profitable long-term contracts in the case of SE.

—has financial and technical roots

The lack of interest of potential investors to acquire SE's nuclear assets results from several factors. The first one is that nuclear assets include an A-1 reactor in Jaslovske Bohunice nuclear power plant that is currently being decommissioned. The A-1 was the first nuclear reactor in Slovakia, being put into operation in 1972. After five years of operation, the A-1 was shut down due to two accidents, and it has been in the process of decommissioning by SE's affiliate Vyradovanie jadrovoenergetických zariadení (VYZ) since that time. The A-1 nuclear plant, however, might be excluded from the privatization of SE. Another problem area is the planned shut down and decommissioning of two reactor blocks (each with an installed capacity of 440 MW) in 2006 and 2008, in nuclear plant V-1 in Jaslovske Bohunice. The shut down of these reactors was the condition of the successful conclusion of EU negotiations in the "Energy" chapter. The shutdown of V-1 will be partially financed by the European Bank for Reconstruction and Development, which has already signed an agreement with the Slovak government on the provision of credit worth EUR 150m. The total costs of shutdown are estimated to be EUR 375m and the rest of the resources should come from the State Fund for Decommissioning of Nuclear-energy Facilities (SFDNF). Another EUR 370m will be needed to finance the decommissioning of the two reactors. The funds of SFDNF should also be used to construct a durable nuclear waste dump in the period 2030 – 2040. The planned shut down of two blocks in Jaslovske Bohunice in 2006 (2008) is apparently one of the reasons why potential investors have shown no interest in the privatization of SE's nuclear assets. The early closure of the two blocks is unlikely to qualify as stranded costs.

Mochovce nuclear power station has not been completed yet

The second nuclear plant in Mochovce, which was projected to have four reactor blocks (each with an installed capacity of 440 MW), has not been completed yet. The first two reactors were put into operation in 1999 and 2000. SE has already invested almost EUR 500m to constructing the 3rd and 4th reactor blocks in Mochovce. The construction was suspended in 1992, and subsequently the blocks were conserved. The partially built nuclear plant thus represents stranded costs for SE because these assets do not generate any revenues, and yet SE has to bear financial costs related to the bank credits that financed their construction. The way of possible compensation of these stranded costs by the state has not been approved yet. Similarly, the government is yet to decide about the SE'S affiliate VYZ, which might be excluded from SE's assets.

Table 3
Stranded costs as proposed by SE
Sk m, EUR m

Item of stranded costs	Amount (SKK m)	Amount (EUR m)
Blocks 3. and 4. of Mochovce nuclear power station	19,001	440
Assets of V1 Jaslovske Bohunice (those not depreciated as of 2006 and 2008)	3,413	80
De-sulphurization of thermal blocks (ecologic costs)	13,991	325
Brown coal (lignite) burning Novaky thermal power plant	5,703	133
Hydroelectric power station Gabčíkovo	2,056	48
Total stranded costs	44,164	1,026

Source: Slovenske elektrarne

Stranded Costs

Compensation of stranded costs needs to comply with EU legislation

The compensation of stranded costs has to be in compliance with EU directives on the provision of state support to private companies. Importantly, solving the stranded costs issue is one of the prerequisites of the successful liberalization of the electricity market and the privatization of SE. According to Eirik Svindland, an advisor to the Ministry of Finance, only those stranded costs that originated prior to the end of 1999 - when the EU declared the beginning of pre-entry negotiations with Slovakia - may be acknowledged. Therefore SE will probably not be able to include in stranded costs the closure of two reactors in Jaslovske Bohunice, the burning of brown coal, or environmental costs and capital outlays to Gabčíkovo hydroelectric power station. On the contrary, in Eirik Svindland's opinion, SE could include the cost of the construction of two blocks of the nuclear power station Mochovce in stranded costs.

Non-profitable SE contracts

The stranded costs of SE, which result from contracts with Paroplynovy cyklus and Hornonitrianske bane Prievidza, have their origins in political decisions. The CCGT cycle Paroplynovy cyklus, built in 1998, was established by three state companies – SE, ZSE and natural gas distributor Slovensky plynarensky priemysel. The project was financed by a 15-year credit from the European Investment Bank, and the profitability of Paroplynovy cyklus was ensured by a long-term contract on the supply of electricity to SE and heat to ZSE (at present to the heating plant Bratislavská teplarenska, which has been separated from ZSE). SE now considers the contract with Paroplynovy cyklus to be non-profitable, in a similar way as the contract with the Hornonitrianske bane Prievidza mine. The mine supplies SE with more than 2m tons of lignite per year, which helps retain employment in the mining region. SE's managers say that the lignite is more expensive and has lower heat value than black coal imported from the Czech Republic.

	Approval of these items as stranded costs is
<ul style="list-style-type: none"> Losses from the operation of two blocks in nuclear plant Mochovce (EMO), i.e. all or parts of capital costs Stranded investments into EMO units 3 and 4 (a formal termination of the project would be required) Power purchase agreement with Paroplynovy cyklus Bratislava The effect from reduced sales on the ability to 	<ul style="list-style-type: none"> Early closure of two blocks in Jaslovske Bohunice Cross-subsidization of lignite burning in Novaky thermal power station Environmental costs (other EU regulation, ordinary depreciation near completion) Recovery of cross-subsidy to Water Work Gabčíkovo (problem is not related to EU)

Compensation schemes for the stranded costs

The stranded costs issue needs to be solved in order to create equal conditions for all players in the liberalized market. Otherwise, SE would be in a disadvantaged position not by its own fault. Here are a few ways how to compensate the stranded costs of SE:

- incorporation of stranded costs into SE system fees for all consumers,
- new SE owner would undertake an obligation to settle the stranded costs, which would reduce the privatization price of SE,
- direct state subsidy to SE,
- direct compensation of stranded costs by the state. This alternative is analogous to the settlements of "bad debts" of Slovak banks prior to their privatization.

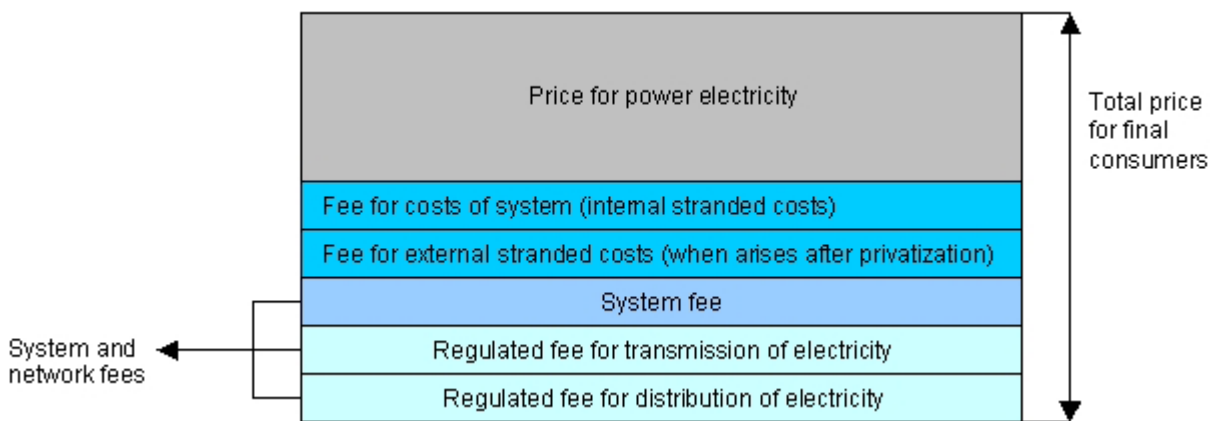
Internal and external stranded costs

According to Andrej Juris, the vice president of NERA Economic Consulting, the stranded costs can be divided into internal and external. Internal costs are those directly related to the operation of power plants and legislation norms, and include the extra costs of domestic brown coal for Novaky. They should be calculated each year and compensated by system fees to SE that would be paid by all consumers. The external stranded costs relate to state investments, and include outlays for the construction of the 3rd and 4th block of Mochovce or to the decommissioning of nuclear plant V-1 in Jaslovske Bohunice. Andrej Juris proposes that a private investor could either take over the commitments or accept a higher privatization price. Another option is to compensate external stranded costs with a direct state subsidy.

Stranded costs should be compensated for by the state

We see the option of the direct compensation of stranded costs by the state to be the most appropriate solution. The state should resolve SE's stranded costs in the same way as it restructured banks prior to their privatization. The fact is that the current bad financial situation of SE was caused by political decisions of previous governments which postponed inevitable deregulation of electricity prices and pushed through several investment projects, such as the completion of Mochovce.

Diagram 1
Structure of final price of electricity if stranded costs are compensated by electricity consumers



Source: Symsite Research

Liberalization of electricity market in Slovakia

The EU accession process has triggered significant changes that affect the electric energy sector in Slovakia. One of the main principles of the liberalization of the electricity market is to create an environment where companies operate in a competitive market without any discrimination. It means that the distribution companies must charge non-discriminatory tariffs for the transmission and distribution of electricity and independent power producers may enter the network under equal conditions. The basic condition of a competitive electricity market is the right of customers to choose their supplier of electricity, and the obligation of a distribution company to supply it on a non-discriminatory basis. The liberalization of the electricity market in Slovakia is outlined by the Ministry of Economy decree No. 548/2002, which proposes full liberalization from January 1, 2005. At that time, all legitimate customers will be able to choose their electricity supplier and import electricity from abroad without any limits. However, the liberalization will not apply to households. The full liberalization of electricity markets for industrial consumers and businesses in the current EU member countries is planned for 2004. For EU households, full liberalization is planned for mid-2007. We anticipate that the full liberalization of the electricity market for households in Slovakia will also come into force at that time.

Time schedule for liberalization of electricity market in Slovakia

In 2003, legitimate customers are those with an annual consumption of electricity exceeding 40 GWh. As well as having the right to choose their supplier, they are also allowed to import one third of their annual electricity consumption.

Table 4
Time schedule for liberalization of electricity market in Slovakia
GWh

Date	Legitimate customers with annual consumption exceeding	Electricity that legitimate customers are allowed to import
Jan 1 2002	100 GWh	one twelfth of annual consumption*
Jan 1 2003	40 GWh	one third of annual consumption
Jan 1 2004	20 GWh	two thirds of annual consumption
Jan 1 2005	0 GWh	no limits

Source: Ministry of Economy of the Slovak Republic
* from October 1, 2002

Distribution companies have also become legitimate customers

The three regional distribution companies in Slovakia (ZSE, SSE and VSE) have also become legitimate customers in 2002. They are allowed to choose a supplier of electricity for their consumers, e.g. households or so-called protected customers⁴. However, the minimum limit of annual consumption of distribution companies has been set at 0 GWh. In 2003, the distribution companies can import up to one fourth of their annual consumption, as well as of the consumption of legitimate customers they supply. This limit will increase to two thirds of the annual consumption in 2004. The distributors will be allowed to import electricity without limits from 2005.

⁴ Under protected customers, we understand those consumers who do not belong to legitimate customers, or those legitimate customers who do not use their right to choose their electricity supplier.

Table 5
Maximum amounts of imports for distribution companies
GWh

Date	Electricity that distributors are allowed to import
Oct 1 2002	one twelfth of annual consumption
Jan 1 2003	one fourth of annual consumption
Jan 1 2004	two thirds of annual consumption
Jan 1 2005	no limits

Source: Ministry of Economy of the Slovak Republic

Note: Under annual consumption, we understand the sum of annual consumption of the distribution company and legitimate customers, which are supplied by the distribution company. The sum is lowered by the consumption of those legitimate customers who are supplied by companies other than the distribution company.

Most customers have not used their legitimacy to choose an electricity supplier yet

According to distribution companies, there are about 40 consumers with an annual consumption exceeding 40 GWh in Slovakia, which became legitimate customers in 2003. Besides them, SE registers four direct legitimate customers – the industrial companies Slovalco, U.S. Steel, OFZ and Duslo. The only customer who has already used its right to choose its electricity supplier is the car assembly plant Volkswagen Slovakia. The company now imports one third of its electricity consumption from Czech producer CEZ. The price of so-called power electricity⁵ supplied by CEZ is 10% lower compared with SE, in the case of consumption of more than 7,000 hours a year at base load. The main reason is the different financial condition of SE and CEZ. Other companies, U.S. Steel Kosice, ZSNP Ziar nad Hronom, and Duslo Sala, have also shown preliminary interest in imports of electricity. Nonetheless, the overwhelming majority of legitimate customers still purchase electricity from SE. There are several reasons why the competitive electricity market in Slovakia is not developing yet:

- dominance of Slovenske elektrarne in the domestic production of electricity (share of +80%),
- absence of system operator and traders in the electricity market,
- missing legislation for electricity trading,
- companies – customers trivialize the benefits of liberalization of the electricity market.

Dominance of SE limits the competitiveness of the internal electricity market in Slovakia

The dominant producer of electricity in Slovakia is the former state monopoly SE. In 2002, it accounted for 83.6% of the production of electricity in Slovakia. The rest of electricity is generated by the state-owned CCGT cycle Paroplynovy cyklus (3.5%), state-owned heating plants (1.7%), state hydroelectric power station Vodne dielo Zilina (0.6%), and so-called auto-producers (9.5%) generating electricity predominantly for their own consumption. Moreover, SE purchases electricity from Paroplynovy cyklus. Installed capacities of other independent producers are so low that they can cover the consumption of a very limited number of legitimate customers. Under these circumstances, liberalization is off to a slow start. However, we anticipate the increase in domestic competition in the case of the division of SE into two separate companies, and after the more significant opening of the Slovak market to imported electricity.

The establishment of a system operator

⁵ Under so-called power electricity, we understand the electricity without provision of system and support services. The end price of electricity for a legitimate customer consists of the price of power electricity, system and support fees, fee for transmission and distribution of electricity.

At present the Slovak electricity market still lacks an independent system operator who would organize spot market with power electricity. Presently, consumers can agree the supplies of electricity only on the basis of bilateral contracts with power producers. The main reason is the absence of underlying legislation. An independent system operator would also settle payments for differences between the real consumption of electricity and the agreed consumption. An effective spot market with electricity should push the prices of power electricity down. The scope of activities of the system operator will include:

- organization of spot market with power electricity,
- measurement of real supplies of electricity and their comparison with agreed flows.

An important condition for the development of a liberalized electricity market is the accurate measurement of electricity flows in the system as well as the reservation of a part of cross-border connectors' capacities for spot contracts on electricity supply. This could increase the liquidity of the electricity market. According to Jozef Urmin, head of the energy section in the Ministry of Economy, the system operator usually covers about 10% of the electricity market. The five largest companies in the electric energy sector - SE, transmission grid operator SEPS and distribution companies ZSE, SSE and VSE - had intended to form an independent system operator in January 2003. However, the process of its creation has been delayed due to the privatization of the distribution companies. Representatives of the Ministry of Economy say that the establishment of the system operator is planned for June 2003. The operator should be open to the possible entry of other subjects in the future, for example, commodity exchanges or consumers' associations, which could advocate their interests. The independence of the system operator should be ensured by mutual control by all founders.

—and electricity traders

At present Slovak legislation does not define electricity traders. Thus the only subjects that can presently import electricity are distribution companies and legitimate customers. The establishment of electricity exchange in Slovakia is not expected, according to the Ministry of Economy. The ministry says that SE - due to its high stranded costs and debts - would not be able to compete with other suppliers in the electricity exchange. The electricity exchange already functions in the Czech Republic and consumers can trade weekly, monthly or yearly supplies of electricity there. Thereby the electric exchange covers the gap between long-term bilateral contracts and short-term supplies traded through the system operator's spot market.

The Slovak electricity market also lacks other related financial markets, like electricity futures or options markets, which exist in developed countries. The development of electricity trading in Slovakia will speed up the creation of a competitive environment in the electric energy sector and will bring benefits for consumers of electric power.

Companies need trained staff to utilize benefits of the liberalized market

The liberalization of the electricity market brings new opportunities for legitimate customers. However, the changing environment requires additional investments for staff training. Some managers also trivialize the benefits of the liberalization - electricity costs can be reduced by only a small percentage by changing electricity supplier, and electricity costs often make up less than 10% of total costs in many companies. Besides, the entry to an open market can be risky for legitimate customers. In the case of entering bilateral contracts with an unreliable partner - who breaches the agreement - a legitimate customer may end up paying more, or even jeopardize the stability of electricity supplies. Another factor is the conservatism of some Slovak managers that have got used to purchasing electricity from SE.

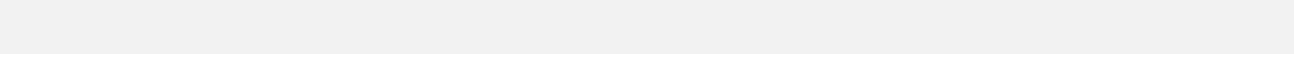
What will liberalization and privatization bring?

The liberalization of the electricity market in Slovakia will bring mainly positive effects for consumers but the sector will not avoid negative effects either. The growth of effectiveness in generation, transmission and

distribution of electricity will inevitably be accompanied by social impacts – payroll cuts in electric energy companies (see "Effects on labor market" for more information). Given the delayed deregulation of electricity prices and the existence of cross-subsidies till the end of 2002 (with some minor exceptions), Slovak consumers face a sharp hike in electricity prices in 2003. According to Jan Matusky, the chairman of the regulatory body URSO, the price hike has already removed cross subsidies in most cases and prices should increase only by the rate of inflation over the next few years. The creation of a competitive environment in the sector will increase efficiency at all levels of the electricity market, which will probably bring about more effective allocation of resources and push prices of electricity down in the medium term. Many developed countries in the EU, which liberalized electricity markets in the 1990s (e.g. Great Britain, Germany, Nordic countries), have experienced a decrease in electricity prices. This will be one of the greatest benefits of the liberalization for consumers. Last but not least, liberalization and privatization should also bring about better customer service, as well as development of consulting services. The distribution companies plan to focus more on their customers through providing quality products, services and effective electricity trading.

- Higher effectiveness at all levels of electricity market – generation, transmission and distribution
- Competitive environment will improve services to clients
- Lower electricity prices in the medium term
- More effective allocation of resources
- Better customer services

- Social costs – payroll cuts and closure of non-profitable facilities
- Stranded costs – past investments of energy companies which would be profitable under the former regulatory framework do not need to have a positive return on investment in liberalized electricity market



Growth effects of EU accession on the electric energy sector

Effects on the production of electric power

The generation of electricity in Slovakia is concentrated in Slovenske elektrarne

The generation of electricity is currently concentrated in Slovenske elektrarne (SE), which produced 83.6% of this commodity in Slovakia in 2002. The share of other independent power producers is low. The level of concentration is one of the highest in comparison with other CEE countries. For example, Czech CEZ had a 69.2% share of electric power production in the Czech Republic in 2001, whereas in Hungary, each power station is an independent legal entity and so the concentration of production is even lower.

The volume of total production of electricity in Slovakia will fall over the coming years

The year 2002 saw the total production of 32,830 GWh of electricity in Slovakia, which was a 2.6% annual growth. Slovenske elektrarne accounted for 83.6% of the total, the rest of the electricity was generated by so called auto-producers⁶, heating plants and other independent producers of electricity (see "The effect of EU accession on market structures" for more information). SE's share of total production has been declining since 1992, from 86.9% in 1992 to 83.6% in 2002. We expect the pace of the fall to speed up in relation to the opening of the Slovak electricity market to electricity imports. In 2003 legitimate customers are allowed to import up to one third of their consumption of electricity, in 2004 two thirds, and from 2005 on, legitimate customers will be able to import electricity from abroad without any limits. Therefore, we assume that the volume of electricity production in Slovakia will decline, at least in the short-term, due to increasing imports of cheaper power electricity by legitimate customers and distribution companies. The reason is that the prices of power electricity are 10-15% lower in the Czech Republic at present than the prices of SE. In the medium-term, the development of SE's production will very much depend on the result of privatization and settlement of stranded costs. If acquired by a strong European player, SE will definitely fight hard to offer competitive prices, while building new sources to replace those shutdown. The decline of its market share would in this case cease in the medium term.

Table 6 shows the development of total electricity production in Slovakia in the period 1992-2002 and the share of SE in the total production.

⁶ Under auto-producers, we understand mainly industrial enterprises, which generate electricity as a side product of the production process. Some auto-producers have generators with an installed capacity that can cover a considerable part of electricity consumption.

Table 6
Development of electricity production in Slovakia 1992 - 2002
GWh, unless otherwise stated

Year	Production of SE	SE share (%)	Other producers	Share of other producers (%)	Total production	y/y change (%)
1992	19,416	86.9	2,930	13.1	22,346	
1993	20,577	87.9	2,840	12.1	23,417	4.8
1994	21,825	88.2	2,915	11.8	24,740	5.6
1995	22,861	88.2	3,044	11.8	25,905	4.7
1996	22,007	87.0	3,283	13.0	25,290	-2.4
1997	21,171	86.2	3,377	13.8	24,548	-2.9
1998	22,025	84.7	3,992	15.3	26,017	6.0
1999	23,425	84.0	4,468	16.0	27,893	7.2
2000	26,258	85.0	4,619	15.0	30,877	10.7
2001	27,215	85.0	4,788	15.0	32,003	3.6
2002	27,445	83.6	5,385	16.4	32,830	2.6

Source: Slovenske elektrarne

Results in January 2003 confirm trends of decline in domestic production

SE's results in January 2003 confirmed trends of the decline in domestic electricity production. The production of SE fell by 5.3% on y/y basis to 2,516 GWh of electricity. The volume of SE's exports fell by even 21% y/y to 410 GWh. The share of SE in the total production of electricity in Slovakia decreased to 79.8%. This fall was mainly caused by increased imports of electricity from the Czech Republic by distribution companies (see "Effects on foreign trade" for more information). After the Slovak electricity market is fully liberalized and open to foreign countries in 2005, we assume that the share of SE's production in total consumption of electricity in Slovakia could sink to as low as 60-70%, especially to the benefit of Czech producer CEZ and independent local power producers. Mainly distribution companies, but also other legitimate customers, will opt for cheaper Czech power electricity. Besides, the opponents of the liberalization process claim that distribution companies, owned by major European players (E.ON, RWE and Electricite de France), will prefer to purchase electricity from their parent companies that are vertically-integrated and run activities in the generation as well as the distribution of electricity.

SE's production depends on successful compensation of stranded costs and privatization

If the government compensates for SE's stranded costs and sells SE to a foreign investor (or leases nuclear assets), the new owner will take necessary measures leading to the increased effectiveness and competitiveness of SE. At the moment, the price of power electricity generated in SE is higher than in neighboring countries, which stems from the lower efficiency and higher financial costs of SE. The volume of production similarly depends on the ability of SE to export electricity to saturated European markets. At present, SE exports electricity to various countries at a price equal to the variable costs of its generation.

SE's production will decline in forthcoming years

SE has the disadvantage of relatively high indebtedness in comparison with foreign counterparts, and financial costs make up about 25% of total SE costs. The integration of the Slovak electricity market into a single liberalized EU one will expose SE to strong competition of efficient and financially consolidated companies. Therefore we expect a decline in the production of SE in forthcoming years, based on four factors. Firstly, we assume that SE production will suffer due to market liberalization. In 2004, legitimate customers are allowed to import two thirds of their consumption, and in 2005 when the market will be fully liberalized. Secondly,

the share of SE in total production in Slovakia might drop to the benefit of a new CCGT plant in Malzenice (developed by Swiss Advanced Power), which should generate up to 3,000 GWh of electricity each year. Thirdly, one block with an installed capacity of 440 MW in Jaslovske Bohunice should be shut down in 2006. This will mean a yearly reduction of SE generation by about 3,000 GWh. Fourthly, production in two conventional blocks of Novaky should be terminated in 2006 too.

We have elaborated two scenarios for the Slovak energy market for the period 2003 – 2006. Both scenarios are based on the following factors:

- two blocks in the nuclear power station Mochovce will not be completed,
- full liberalization of the electricity market for businesses in 2005,
- shut down of one nuclear reactor in Jaslovske Bohunice plant in 2006,
- shut down of two blocks (installed capacity 110 MW together) in Novaky in 2006.

Scenario A

Scenario A assumes that SE's privatization will be a slow process. Financially weak SE will be losing customers to the benefit of foreign power producers like CEZ. Lack of capital will prevent it from building new sources to replace those shut down. New independent producers will arise. The most important of them will be Advanced Power in cooperation with Siemens, which will put the Malzenice CCGT plant to operation during 2004 and it will supply ZSE with electricity instead of SE. Under these circumstances, the volume of SE's production would drop by 7-9% annually in 2003-2006, to 19,000 GWh in 2006. This would represent only a 61.3% share of the gross consumption in Slovakia. The generation of other power producers would increase up to 8,900 GWh yearly from 5,385 GWh in 2002.

Scenario B

Scenario B is based on assumptions that the SE's privatization will be completed in 2004. Combined with the state compensation of stranded costs, SE will end up as a financially consolidated company. SE pricing and trade policies will be more competitive. Even under these circumstances, however, SE will lose some legitimate customers in favor of local and foreign competitors. The annual drops in SE's production of electricity should range around 5% in the period 2003 – 2006 and SE may even make some capital outlays to replace capacities that will be shut down in 2006 and 2008.

The scenario B also assumes that Malzenice CCGT plant will be put into operation not until 2006—it is not groundless to anticipate that private investors will wait with the launch of this facility until the first block of the Jaslovske Bohunice nuclear power plant is shut down. Moreover, even Advanced Power admits it lacks any customers for produced heat, which reduces the efficiency of the plant dramatically (the surrounding area is currently supplied by nuclear power plant Jaslovske Bohunice).

These developments would translate into SE's production amounting to 22,300 GWh in 2006, which would represent a 71.6% share of the estimated gross consumption of electricity in Slovakia. The generation of other Slovak power producers would rise only to 5,890 GWh in 2006, in comparison with 5,385 GWh in 2002.

Table 7
SE production as a share of gross consumption of electricity in Slovakia
GWh, %

	2001	02/01	2002	03/02	2003f	2006f
Gross consumption	28,325	1.2	28,674	1.1	28,990	31,248
Production of SE	27,215	0.8	27,445	(A) -9.0 (B) -5.0	(A) 24,975 (B) 26,073	(A) 19,128 (B) 22,354
Share of SE (%)	96.1	-	95.7	-	(A) 86.2 (B) 89.9	(A) 61.3 (B) 71.6
Other producers	4,788	12.5	5,385	2.1	5,500	(A) 8,910 (B) 5,890

Source: Slovenske elektrarne, Symsite Research
f – forecast, A – negative scenario for SE, B – positive scenario for SE

The effect of EU accession and liberalization will decrease domestic production

The EU accession process and the opening of the Slovak electricity market to competitive European markets are likely to cause a decline in the domestic production of electricity, in case of both scenarios. The distribution companies will opt for cheaper imported electricity to supply the island areas and other customers that will not use their legitimacy as well. Such a trend could only be reversed by a financially consolidated SE, backed by a strong new owner, and relieved of the burden of stranded costs. Nonetheless, it is very likely that SE will be a loser in terms of generation in the next couple of years. We expect that the volume of SE exports will also fall in future years because of its currently weak competitiveness. Besides imports, local independent power producers will also fill the gap left by SE.

Effects on the consumption of electric power

The consumption of electricity in 2001 was still well below the 1989 level

The consumption of electricity in Slovakia in 2001 (20,725 GWh) comprised only 90.1% of the volume of consumption in 1989, when it reached its all-time high. The consumption of high voltage electricity by industrial consumers fell the most, in 2001 it only represented 81.3% of its 1989 level. This came as a result of political and economic changes after 1989, namely the shift towards a market economy. After a few years of growth, the consumption of high voltage electricity started to decrease again in 1997. At that time, increased energy efficiency in industrial plants outweighed the factor of growing industrial output. Slovak industry started to be dominated by new, energy-efficient plants of car- or car-component makers. Although the consumption of industrial enterprises increased by 5% in 2000 for the first time since 1996, it stabilized around the same level in 2001 because of the slowing down of growth of industrial production from 9% in 2000 to 6% in 2001.

Table 8
The developments of electricity consumption by high and low voltage consumers
GWh, index of y/y growth in %

Year	Businesses (high voltage)		Businesses (low voltage)		Households		Other consumption		Total consumption	
1988	16,453	-	1,940	-	3,444	-	1,150	-	22,987	-
1989	16,658	1.01	2,022	1.04	3,585	1.04	1,222	1.06	23,487	1.02
1990	16,411	0.99	2,021	1.00	3,717	1.04	1,244	1.02	23,393	1.00
1991	14,597	0.89	1,977	0.98	3,802	1.02	200	0.16	20,576	0.88
1992	13,492	0.92	1,874	0.95	3,701	0.97	193	0.97	19,260	0.94
1993	11,952	0.89	1,964	1.05	4,137	1.12	189	0.98	18,242	0.95
1994	12,199	1.02	1,977	1.01	4,489	1.09	176	0.93	18,841	1.03
1995	13,377	1.10	2,086	1.06	4,998	1.11	169	0.96	20,630	1.09
1996	14,336	1.07	2,201	1.06	5,451	1.09	197	1.17	22,185	1.08
1997	13,857	0.97	2,300	1.04	5,562	1.02	183	0.93	21,902	0.99
1998	13,395	0.97	2,328	1.01	5,666	1.02	178	0.97	21,567	0.98
1999	12,984	0.97	2,344	1.01	5,673	1.00	167	0.94	21,168	0.98
2000	13,584	1.05	2,186	0.93	5,337	0.94	152	0.91	21,259	1.00
2001	13,550	0.99	2,143	0.98	4,880	0.91	152	1.00	20,725	0.97

Source: Slovenske elektrarne

Note: Consumption is measured as useful electric supply

Development of electricity consumption in 2002

The gross consumption of electricity⁷ in 2002 reached 28,674 GWh, which is an annualized growth of 1.23%. The consumption of households supplied by ZSE increased by 1.52% y/y, while consumption of households supplied by the other two distribution companies, SSE and VSE, decreased by 9% and 1.2% respectively. The fall in consumption was probably caused by a milder weather as well as by hikes in electricity prices, which made some households shift to means of heating other than electricity. However, this decline in the consumption of households was more than outweighed by higher consumption of businesses. As a consequence, 2002 saw an increase in total electricity consumption for the first time since 1997. Two major factors were behind this development: the prices of electricity were not hiked (because of the parliamentary election in 2002) and industrial production, which determines the consumption of businesses, rose by 9.6% y/y in 2002. A slight growth of gross electricity consumption continued in January 2003, rising by 0.3% y/y to 2,829 GWh.

Traditional industries have the highest consumption of electricity

The structure of consumption of electricity by industrial sectors in 2001 (the data for 2002 is not available yet) reveals that the sectors of metallurgy, chemicals, petroleum and pulp and paper were among the top energy consumers. These industries made up about 50% of the total electricity consumption in Slovak industry. Metallurgy itself had a 25% share, which stems partly from the high-energy consumption of production, but also from the obsolescence of manufacturing plants and machinery, which were mostly built prior to 1989.

The largest industrial consumers of electricity include aluminum producer Slovalco (consumption of 1,566 GWh; 7.6% of the Slovakia's total electricity consumption), U.S. Steel Kosice, manufacturer of ferroalloys OFZ Istebne (803.8 GWh; 3.9%), Slovnaft refinery, and chemical products manufacturer Duslo Sala. All of the largest consumers except Slovalco have their own generation capacities. In total, Slovenske elektrarne supplied these five largest customers with about 3,000 GWh of electricity in 2001. This may change since the

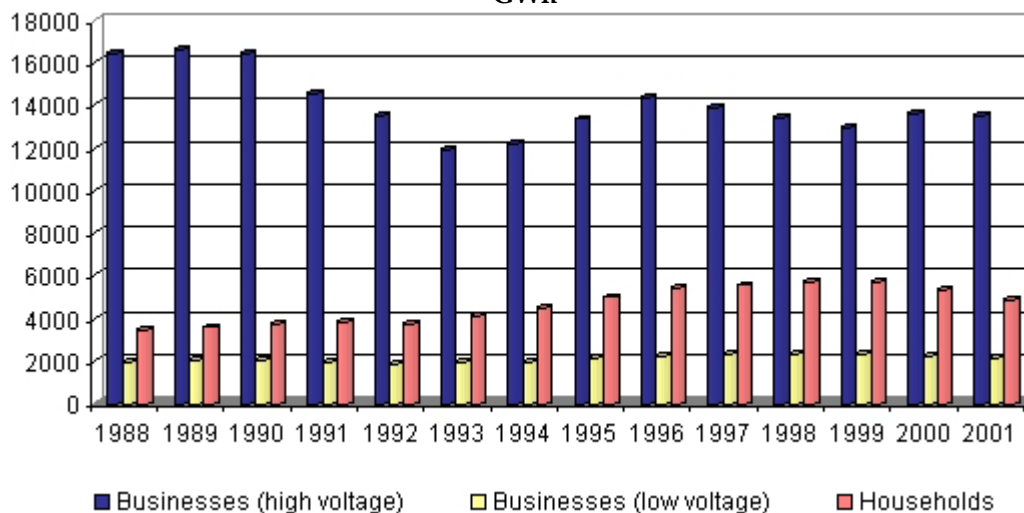
⁷ The gross consumption of electricity includes own consumption of power stations and auto-producers' generation facilities, except the consumption of businesses and households.

process of the opening-up of the internal electricity market in Slovakia enables customers to choose their electricity suppliers and import a certain amount of electricity from abroad (in 2003 one third of the annual consumption).

Household consumption was rising up to 1999—

Households experienced a reverse trend in electricity consumption, as their consumption rose up to 1999 except for 1992. Their all-time high consumption, at 5,673 GWh in 1999, exceeded the 1988 level by 65%. The main cause was the expansion of heating by electricity to the detriment of solid fuel heating (coal, coke). The motivation behind the conversion of many households to electric heating systems was the financial benefit of this type of heating. Electricity prices, unlike the prices of solid fuels, were not increased at the beginning of the 1990s. Moreover, households who used electricity for heating were subject to special (low) tariffs by electricity distribution companies. In this way, Slovenske elektrarne (SE) attempted to compensate for a drop in the consumption of industrial companies.

Graph 1
Consumption of electricity in Slovakia and its y/y development
GWh



Source: Slovenske elektrarne, graph: SymSITE Research

—but consumption fell in 2000 and 2001

After the growth of household consumption since 1993, the consumption of electricity dropped in 2000 and 2001, by 6% and 9%, respectively, on a y/y basis. The drop was mainly caused by the partial deregulation of electricity prices as well as a mild winter in 2000. Electricity prices were raised by 40% on average in 2000 and by a further 15% in 2001. In general, households' response to hikes in electricity prices is quite flexible and thus the deregulation made some households opt for solid fuel heating again, which became cheaper in comparison with electricity heating. In 2002 the government of Mikulas Dzurinda postponed the hike in electricity prices for political reasons (parliamentary election in September 2002). Although the deregulation of prices for households did not take place in 2002, the consumption of households slightly dropped according to the results of two distribution companies – SSE and VSE. We expect that in 2003 the household consumption of electricity will slightly fall because of sharp hikes in electricity prices by about 25% effective as from January 2003.

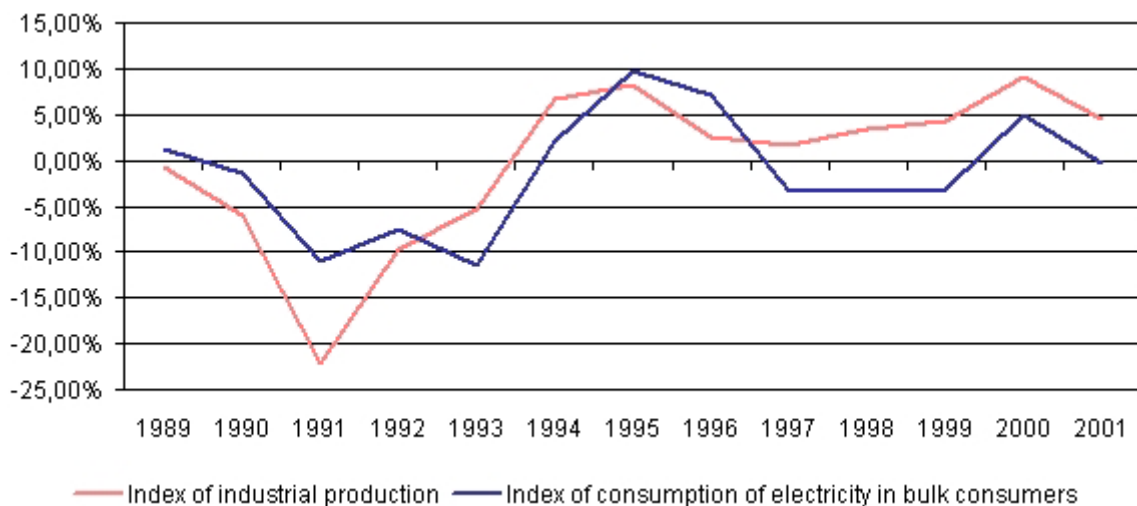
Factors influencing the consumption of electricity

Connection between industrial production and consumption of electricity in bulk consumers

Graph 2 shows that there is a strong correlation between the index of industrial production and the index of consumption of electricity by bulk consumers (i.e. industrial companies). Every year from 1990 to 1996, the consumption of electricity by bulk consumers reacted in the same way to changes in industrial production (i.e. it increased as industrial production increased and vice versa). A change in this trend did not come until 1997, when despite continued growth in industrial production, the consumption of electricity in bulk consumers experienced a drop. The reasons for this development include, in particular, the increased energy efficiency of industry that to a great degree was influenced by the arrival of foreign investors into Slovak engineering. One major aspect of energy savings in bulk consumers is the greater efficiency of state-of-the-art electric motors, as well as greater savings in electrically heated production halls (lower ceilings and better insulation). Another aspect is the greater proportion of less demanding industrial sub-sectors in terms of energy over total industrial production. A significant role in the growth of industrial production was played by Volkswagen, which alongside its own constantly increasing production, provided the impetus for the development of a sub-contractor sector. The production of cars is, however, less demanding in terms of energy than more traditional sectors of the Slovak economy such as mechanical engineering which have outdated machinery.

Graph 2

Comparison of the dependence of energy consumption of bulk consumers and industrial production



Source: Slovenske elektrarne; graph Symsite Research

From 1997 consumption has been influenced by the level of energy efficiency of industry

Taking into account the relatively high energy demands within the Slovak economy, we are of the opinion that the scope for increasing energy efficiency in industry has not yet been fully depleted. Considering the future macroeconomic and political developments in Slovakia and especially the entry of Slovakia into the EU in 2004, we anticipate increasingly more foreign investment into Slovakia, thereby leading to further growth in the energy efficiency of production. An example is the decision of French carmaker PSA to invest EUR 700m into the development of a new plant in the Trnava region, which will also lure other car component makers to Slovakia. On the other hand, some Slovak industrial companies without foreign capital, facing weak access to credit and with poor financial condition, will not increase their production or will even go bankrupt. The 20% increase in electricity prices effective from January 1, 2003, may also make some industrial consumers invest into increasing their energy efficiency. However, we expect that during

2003 – 2006 the growth of electricity consumption, stemming from the growth of industrial production, will exceed savings from higher energy efficiency of industrial consumers by 2-3% y/y.

A sharp hike of electricity prices in 2003 may have negative effects on some industrial companies

A sharp 20% hike of electricity prices in 2003 may have negative effects on the competitiveness of some Slovak companies. Firms in traditional industries without foreign capital and in energy-demanding sectors will be hit particularly badly. Many of them export most of their production and compete with firms enjoying lower energy costs. On a positive note, they are forced to invest into energy savings, increasing their competitiveness. In some cases, though, the price hikes may lead to production and payroll cuts. The Association of Slovak Employers AZZZ estimates that the hike in electricity prices in 2003 will cause an increase in energy costs by about EUR 250m to industry, and this will mostly affect industrial production. However, the representatives of the regulatory body URSO claim that private companies have had enough time to get ready for the hike.

Consumption of electricity in households is dependent chiefly on the number of electrically heated households

Several factors will influence the consumption of electricity by households: the extent of electric heating, the price of electricity, the purchasing power of the population, changes in energy efficiency of electrical appliances, as well as changing consumer preferences (e.g. increased use of air conditioning, swimming pools, etc.). The most influential factor is the number of households using electric heating. In 2001 only 3.4% of Slovak households used electricity as the sole source of heating and hot water, whereas these households consumed as much as 18.6% of all electricity consumed by households.

Table 9

Comparison of the dependence of energy consumption of households on energy consumption for heating (GWh, %)

Year	Total household consumption	y/y change	Consumption of fully-electric households*	Share in total household consumption	Consumption of other households	y/y change
1991	3.802	-	90	2,4%	3.712	
1992	3.701	-2,6%	80	2,1%	3.621	-2,4%
1993	4.137	11,8%	159	3,8%	3.978	9,8%
1994	4.489	8,5%	524	11,7%	3.965	0,0%
1995	4.998	11,3%	873	17,5%	4.125	4,0%
1996	5.451	9,1%	1.164	21,3%	4.287	3,9%
1997	5.562	2,0%	1.229	22,1%	4.333	1,1%
1998	5.666	1,8%	1.190	21,0%	4.476	3,3%
1999	5.673	0%	1.217	21,5%	4.456	0,0%
2000	5.337	-5,9%	1.111	20,8 %	4.226	-5,2%
2001	4.880	-8,5%	910	18,6%	3.970	-6,1%

Source: Slovenske elektrarne

*Consumption of fully electric households means consumption of households using electricity for heating and hot water

The number of households using electricity for heating purposes will fall in forthcoming years

We expect that in the forthcoming years there will be no increase in the number of households using electricity for heating. The price of electricity for households was raised by 25% in January 2003. The price for heating by electricity increased even sharper in order to eliminate existing cross subsidies. The price of gas for households grew as well, by 43%. The costs for heating by electricity and gas exceed the costs for heating by solid fuel. Therefore we expect that some households will shift from electricity to brown coal heating and some will decrease their consumption of electricity in 2003. According to the Statistical Office, households currently spend, on average, about 3.7% of their net income on electricity bills. Given the expected increase in electricity prices and assuming constant real incomes of households, the share of electricity cost could increase to 6% for all households. This might result in a fall in households' consumption by about 1-2% in 2003.

Other factors influencing the electricity consumption of households

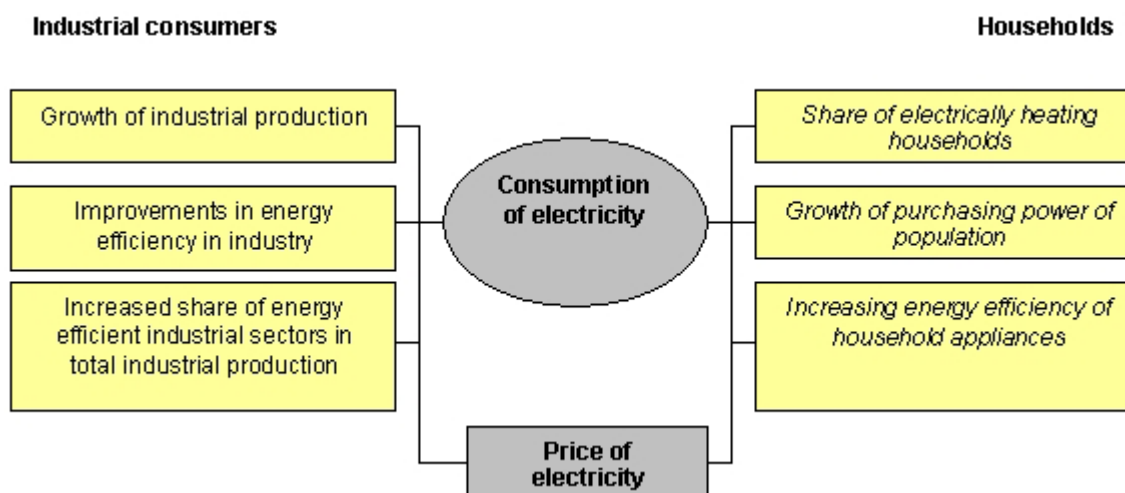
Consumption of electricity by households for purposes other than heating is affected by two opposing factors. On one hand, the energy efficiency of household appliances (televisions, fridges, washing machines, and so on) and lighting is ever increasing, while on the other hand, the number of households using new types of electrical appliances is increasing too (e.g. computers, microwave ovens). Development of consumption of electricity by households for purposes other than heating does signal however, that these two factors more or less balance each other out. We do not expect any marked change in this trend over the next few years, as an increase in the living standard of the population of Slovakia will be gradual.

Prognosis of electricity consumption 2003 – 2006

Our prognosis of electricity consumption in Slovakia for 2003 to 2006 is based on the evaluation of factors that will affect demand. It breaks the market down into several segments - households, large and small industrial consumers. The entry of Slovakia into the EU will have a positive impact on the growth of electricity consumption because of the increase in foreign direct investments, export of Slovak goods, industrial production and purchasing power of citizens. Apart from these factors, consumption will be influenced by the deregulation of prices and market liberalization. We have identified several basic factors that will shape the electricity consumption of both businesses and households (see diagram below).

Diagram 2

Decisive factors influencing the consumption of electricity



Source: SymSITE Research

The total consumption of electricity will rise in next years

We expect the consumption of electricity in Slovakia to rise by 1.1 – 2.8% between 2003 and 2006 (see Table 10). This growth will be driven mostly by businesses, which are supplied by high voltage electricity. The main driving factor will be increased industrial production with y/y growth of 6-7% compared to estimated GDP growth of 4% y/y in next years. The integration of Slovakia into EU and a stable business and political environment will attract new foreign direct investments to various sectors of the Slovak economy. One example is the planned investment of French carmaker PSA in the Trnava region, which should begin production in 2005. At the same time, the expected revival of the EU economy will have a positive impact on Slovak exports, which will increase electricity consumption in many export-oriented industrial companies. A sharp hike of electricity prices in 2003 will probably decrease the electricity consumption of households, but we expect it to rise slightly after 2004. The businesses supplied by low voltage energy should not suffer much from hikes in electricity prices because electricity's share of total costs is negligible.

Table 10
Prognosis of electricity consumption in Slovakia 2003 – 2006
GWh, %

	Businesses (high voltage)		Businesses (low voltage)		Households		Other consumption		Total consumption	
2002e	13,930	2.8	2,170	1.2	4,730	-3.1	150	0.0	20,980	1.2
2003f	14,278	2.5	2,202	1.5	4,588	-3.0	146	0.0	21,214	1.1
2004f	14,692	2.9	2,242	1.8	4,611	0.5	142	0.0	21,687	2.2
2005f	15,191	3.4	2,287	2.0	4,643	0.7	140	0.0	22,262	2.6
2006f	15,722	3.5	2,337	2.2	4,680	0.8	140	0.0	22,879	2.8

Source: SymSITE Research
e – estimate, f – forecast

Effects of accession on foreign trade and evolution of net exports

Since 1995, the Slovak transmission grid has been connected to the system of European transmission grids, which enables the participation of Slovakia in the European trade of electricity. Slovak electric energy dispatching was by law established as a subject that operates distribution lines with a voltage of 110 kV and higher. SE had been running the dispatching until its restructuring and transformation. On January 21, 2002 the Slovak transmission grid SEPS, which operates high voltage transmissions and inter-connection of SEPS with transmission grids of surrounding countries, was excluded from SE. Together with the separation of SEPS, the Slovak electric energy dispatching has been transferred to SEPS as well.

SEPS is connected to the transmission grid of all surrounding countries—

At present the SEPS is connected to the transmission grids of all surrounding countries with the exception of Austria. In 1990 the Slovak transmission grid became a member of CENTREL, which unites transmission grid operators of Visegrad countries, and in 2001 it became a member of the European association of transmission grid operators UCTE. SEPS is interconnected to Poland by double lines of very high voltage (400 kV), to Hungary by two very high voltage 400 kV lines, to Ukraine by one 400 kV line and to Czech Republic by three 400 kV lines and two 220 kV lines. Besides these lines, distribution companies ZSE and SSE have their own 110 kV cross-border lines with the Czech Republic. The highest capacity of 400 kV cross-border connectors exists between Slovakia and the Czech Republic. Its cumulative transmission capacity limit reaches 3,049 MW. This is almost double the transmission capacity as at the borders with Poland and Hungary, which is about 1,660 MW.

Table 11
Interconnections of SEPS to surrounding transmission grids
kV, MW

Transmission grids	Border interconnections	No. of lines	Voltage (kV)	Transmission capacity limit (MW)
Slovakia – Hungary	Gabcikovo – Gyor	1	400	830
Slovakia – Hungary	Levice – Gyor	1	400	830
Slovakia – Poland	Lemesany – Krosno	2	400	831
Slovakia – Ukraine	Velke Kapusany - Mukacevo	1	400	700
Slovakia – Czech R.	Varin – Nosovice	1	400	1,109
Slovakia – Czech R.	Krizovany – Sokolnice	1	400	1,109
Slovakia – Czech R.	Stupava – Sokolnice	1	400	831
Slovakia – Czech R.	Povazska Bystrica – Liskovec	1	220	-
Slovakia – Czech R.	Senica – Sokolnice	1	220	-

Source: CENTREL

—with the exception of Austria

Negotiations on the construction of a 400 kV inter-connector en route Stupava – Vienna (Austria) started in the early 1990s. The lines should have been put into operation after the interconnection of UCTE and CENTREL systems in 1995. Nonetheless, in 1995 the Austrian governing-party suspended the construction works due to the politicizing of the construction of the nuclear power station Mochovce and the possible export of its electricity to Austria. Later on, the Austrian governing-party stated that the agreement still remains valid and the negotiations were restored between SEPS and the Austrian counterparts. This cross-border line should have a transmission capacity comparable with Gyor – Vienna. The lack of cross-border

transmission capacities may be a limiting factor of the further development of a liberalized electricity market.

ZSE plans the construction of 110 kV interconnection line with Austria

Besides the above-mentioned line, the electricity distribution company Zapadoslovenska energetika (ZSE), operating in western Slovakia, plans the construction of 110 kV interconnection lines between Slovakia and Austria. ZSE has already made an agreement with Austrian ENV on technical issues and ways of financing the first interconnection lines between the two countries. At present, the project is at the phase of environmental examination, and in case of its implementation it should be financed by ZSE and ENV on their respective sides of the border. Nonetheless, this interconnection cannot secure sufficient transmission capacities between Slovakia and Austria. In spite of the fact that Austria has legally allowed the import of electricity from abroad, including Slovakia, since January 2002, imports from Slovakia are not possible at present.

Volumes of export, imports and their prognosis

Slovakia has been a net exporter of electricity since 1998

The Slovak economy was dependent on the import of electricity up to 1998. The deficit in trade with electricity peaked in 1997, when as much as 14.3% of the total electricity consumption in Slovakia had to be covered by imports. The gradual decline in consumption since 1998 and the addition of new production capacities (especially the completion of two reactor blocks in Mochovce) translated into a trade surplus of electricity since 1998. The surplus grew since that time, to 4,156 GWh in 2002, representing a 14.5% share of total consumption. The overwhelming majority of the exported electricity was generated by the dominant producer SE.

Table 12
Balance of foreign trade with electricity in Slovakia
GWh, % of consumption

Year	Production	Consumption	Balance of foreign trade (GWh)	Balance (as % of consumption)
1993	23,417	24,529	-1,111	-4.5
1994	24,740	25,178	-438	-1.7
1995	25,905	27,324	-1,419	-5.2
1996	25,290	28,882	-3,592	-12.4
1997	24,548	28,629	-4,082	-14.3
1998	26,017	28,268	-2,251	-8.0
1999	27,893	27,850	727	+2.6
2000	30,877	28,204	2,673	+9.5
2001	32,003	28,325	3,678	+12.9
2002	32,830	28,674	4,156	+14.5

Source: Slovenske elektrarne

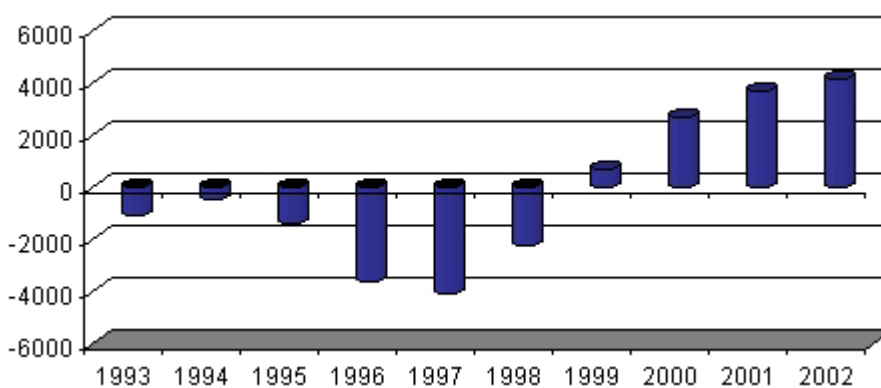
The prognosis of foreign trade with electricity

On January 2003, a government decree permitting legitimate customers to import up to one third of their annual consumption of electricity came into effect. At present the only possibility for them is to import the electricity from the Czech Republic, Poland, Hungary and Ukraine (the Lvov Island is synchronized with

UTCE) because there is no cross-border connection between Austria and Slovakia. The import of electricity from third countries (especially from EU) is questionable because of transport fees. The transmission grid operators of Slovakia, Poland, Hungary and Czech Republic are not fully-fledged members of ETSO (European Transmission System Operators) yet, and they do not participate in the compensation mechanism for cross-border trade with electricity.

The opening of the internal electricity market will lead to increased imports. Already, two electricity distributors, ZSE and SSE, as well as one industrial company, Volkswagen Slovakia, have taken advantage of the market liberalization and import part of their electricity consumption (all from Czech CEZ). The distributors even created so-called island operations in some areas in Slovakia. These islands are completely supplied by CEZ. The declining trend of both exports of electricity and domestic SE production, and the growth of imports can be confirmed by SE results during January 2003. The volume of total exports of SE declined by 21% on a y/y basis to 322.8 GWh. Similarly, the total volume of production fell by 5.3% y/y, to 2,516.3 GWh.

Graph 3
Balance of import and exports of electricity in Slovakia
GWh



Source: Slovenske elektrarne; graph: Symsite Research

The largest export market is Hungary

The largest export country for electricity produced in Slovakia (by SE) has been Hungary over the past years. In 2001 the volume of exports there reached 8,315 GWh of electricity, which has been the largest volume of export to Hungary so far. The rising export of electricity to Hungary caused the overfilling of transmission grid interconnections between Slovakia and Hungary. Concerning other neighboring countries, SE exported 1,208 GWh of electricity to the Czech Republic in 2001, 218 GWh to Ukraine and 2 GWh to Poland.

SE strives to trade actively with electricity

At present there is a general surplus of electricity in the European markets, which causes SE to export electricity at variable costs. Since 1999, SE has focused on active trade policy and the volume of exports was growing each year. At present, except for the exports of SE electricity to transmission grids of surrounding countries, SE trades electricity with Germany where it cooperates with E.ON Netz group, which operates the Germany transmission grid. In 2002, SE also supplied electricity to Romania, Croatia, Serbia and Albania.

Table 13
Volumes of exports of electricity from Slovakia 1998 – 2001
GWh, %

Country	1998	99/98	1999	00/99	2000	01/00	2001
Ukraine	-	-	40	510.0	204	106.8	218
Hungary	2,145	164.0	3,518	214.6	7,550	110.1	8,315
Poland	-	-	7	42.9	3	66.7	2
CR	1,014	218.1	2,212	57.5	1,273	94.9	1,208
Total	3,159	182.9	5,777	156.3	9,030	107.9	9,743

Source: Slovenske elektrarne

Slovakia imports most electricity from the Czech Republic

Slovakia imports the highest volume of electricity from the Czech Republic - in 2001 importing 3,711 GWh. This is almost double the volume imported from Poland in the same year – 2,024 GWh. Ukraine ranked third (330 GWh). In the coming years, we anticipate a rapid growth of imports from the Czech Republic. The dominant Czech producer CEZ, being financially consolidated, offers electricity at a lower price than SE. The Slovak transmission grid operator SEPS is currently preparing the organization of trade with electricity between the CR and Slovakia via a system of auctions.

Table 14
Volumes of imports of electricity to Slovakia 1998 – 2001
GWh, %

Country	1998	99/98	1999	00/99	2000	01/00	2001
Ukraine	1,671	54.2	905	43.1	390	84.6	330
Hungary	83	13.3	11	-	0	-	0
Poland	-	-	1,280	133.0	1,702	118.9	2,024
CR	3,087	92.5	2,854	149.4	4,265	87.0	3,711
Total	4,841	104.3	5,050	125.9	6,357	95.4	6,065

Source: Slovenske elektrarne

We expect imports from the Czech Republic to rise in coming years

The main effect of a liberalization of the electricity market on foreign trade will be the increase in imports of electricity at the expense of SE production. The prices of power electricity generated by SE are currently higher in Slovakia than in neighboring countries, which relates to the higher financial costs and the lower efficiency of SE. Electric power distributor ZSE stated that the average sales price of electricity from SE amounts to EUR 45 per MWh, including fees for system and support services. This figure comes to just EUR 40 in Poland and EUR 37 in the Czech Republic. Therefore we expect that the volume of imports of electricity will rise in the coming years as the Slovak electricity market will open more to foreign countries. At the same time, the share of SE in total consumption of electricity in Slovakia will decline; mainly to the benefit of Czech CEZ and occasionally some Polish independent power producers. This trend will be supported by electricity imported to so-called islands by distribution companies via their 110 kV cross-border lines. We do not assume the increase in imports of electricity from Hungary, since Hungary has been a net importer of electricity for years.

Development of foreign trade with Ukraine is not likely in the foreseeable future

In the long run, foreign trade with electricity may also expand between Slovakia and Ukraine, which is not synchronized with the UTCE system at present. However, the Ukrainian government has declared its intention to join the UTCE system in the future. We do not expect the synchronization of the Ukrainian transmission grid with UTCE for at least a couple of years because of the obsolescence of Ukraine's transmission and distribution systems and the large investments that are needed to modernize them.

Development of exports will depend on the competitiveness of Slovak power producers

In the case of compensation of stranded costs and successful privatization of SE by a foreign investor, SE might be able to export electricity at competitive prices to foreign legitimate customers. The development of domestic production and possible exports of electricity will also depend on the completion of Mochovce. This is still questionable because the acknowledgement of stranded costs in blocks 3. and 4. in Mochovce might require the formal termination of the project. However, this is the subject of negotiations between Slovakia and the European Commission. Independent power producers in Slovakia will also be able to export electricity to foreign legitimate customers or distribution companies if they offer a competitive price. This relates especially to a Swiss investor Advanced Power, which intends to build a CCGT cycle in consortium with Siemens as well as a thermal power plant in cooperation with the mining company Hornonitrianske bane Prievidza.

Insufficient cross-border transmission capacities within the UTCE system

At present, the major obstacle of further development of single EU market with electricity is the insufficient capacity of cross-border transmission connectors, which run near their full capacity. The volume of trade with electricity within the UTCE system reaches only about 9 -10% of the total consumption of electricity. The largest exporter in the UTCE system was France in 2001, with net electricity export representing 14.4% of total electricity consumption in France. At the same time its cross-border transmission connectors used up to 80% of maximum capacity. A similar situation exists in typical transit countries like Switzerland, Germany and Austria today. The development of foreign trade with electricity in Slovakia will thus depend on investments in new cross-border transmission capacities, as well as on the creation of an effective compensation scheme for cross-border transmission tariffs.

The effect of accession on FDI flows in the electric energy sector

Liberalization of Slovak electricity market attracts foreign investors

The liberalization of the electricity market in Slovakia will bring new business opportunities not only for foreign producers of electricity but also for potential investors to new power plants in Slovakia. The relatively stable economic and political environment, as well as the planned entry of Slovakia into the EU in 2004, makes the country attractive for foreign investors to the electric energy sector. Privatization of three distribution companies (ZSE, SSE and VSE) have yielded the government EUR 620m, and further amounts will be invested into the companies. Other investments will come to Slovakia after the conclusion of the on-going privatization of SE, to be completed by the end of 2003. Up till now, two foreign companies have announced an intention to build new power plants in Slovakia – Swiss Advanced Power, and German Siemens. Another inflow of FDI is expected in the CCGT plant Paroplynovy cyklus, which is to be privatized in the foreseeable future.

CCGT power station in Malzenice

Project of construction of CCGT power station in Malzenice

The company Malzenice Power, which is a joint venture of Advanced Power and Siemens, was established with an aim to build a CCGT power station with an installed capacity of 385 MW. Investments should total EUR 230m, and technologies should be supplied by Siemens PTD/PG. According to Adrian Bobula, the CEO of Advanced Power Slovakia Ltd., the project is to be financed by own funds (30% of the budget) and by bank credits (70%). EBRD has already announced it is willing to co-finance the project. The CCGT power plant will be located close to former gas compressor station near Malzenice, which is situated about 60 km away from Bratislava and 3 km from the current nuclear power plant in Jaslovske Bohunice.

Malzenice power plant should generate around 3,000 GWh of electricity yearly

The complex delivery of technology as well as construction works is to be secured by KWE, an energy division of the Siemens group. The power plant should supply 3,000 GWh of electric energy annually for ZSE. This volume of energy represents approximately the production of one reactor in nuclear power plant Bohunice or Mochovce. The annual delivery of 500m – 550m cubic meters of natural gas is to be provided by gas distributor Slovensky plynarensky priemysel. The Malzenice power plant will only generate electricity, unlike other CCGT plants, and the investor does not count on the supply of heat. All heat customers in the surrounding of the Jaslovske Bohunice region, including Trnava and Hlohovec cities, are currently supplied by "waste heat" from the nearby nuclear power plant. According to Mr. Bobula, the plant will be profitable even without having any customers for heat. The construction of the power plant should be completed by the end of 2004.

Malzenice Power searching for customers

Considering the on-going liberalization of the Slovak electricity market, the sale of electricity generated in the Malzenice power plant will depend on the ability to offer competitive prices and ensure the stability of supplies. The potential consumers of electric power generated in Malzenice will be the three distribution companies and other legitimate customers. The Malzenice Power company is currently negotiating with the natural gas distributor SPP on the conditions of contract.

Coal power plant Slovenska uholna elektraren Novaky

Another project of the Swiss investor Advanced Power is the planned construction of the coal power plant located in Novaky. Advanced Power is preparing, in a cooperation with mining company Hornonitrianske bane Prievidza, the construction of a new thermal power station with an installed capacity of 270 MW. The construction should be launched in 2004 and the plant should be put into operation by the end of 2007. The power plant should generate 2,000 GWh of electricity while consuming 1.7m tons of brown coal from Novaky coalfields annually. The Ministry of Economy issued a license for the project in 2000. The total budget should reach USD 300m, of which Advanced Power should finance 70%. To achieve the aim, a new company Slovenska uholna elektraren Novaky j.s.c. has been established with Advanced Power having share of 66% and Hornonitrianske bane Prievidza 34%. Advanced Power has already made preliminary contract with the electricity distributor SSE as well as with Hornotrianske bane. The idea of project was initiated by Hornonitrianske bane, which currently supplies brown coal to the thermal power station Novaky owned by SE. The conclusion of this contract between SE and Hornonitrianske Bane was forced by the Slovak government in order to preserve the "social coal mining" and thus employment in the region. In coming years, the Novaky power station plans to shut down two obsolete blocks with an installed capacity of 110 MWe. This would decrease supplies of coal from Hornonitrianske Bane significantly, taking a heavy toll on the employment in the region. At present the Swiss investor Advanced Power also makes large investments in the power-engineering sector in the Czech Republic, Poland and Hungary.

CCGT plant Paroplynovy cyklus Bratislava

FDIs are also expected to come to Paroplynovy cyklus Bratislava

Another inflow of FDI is expected in the state-owned independent power producer Paroplynovy cyklus, j.s.c. Bratislava (PPC), which is to be privatized in the foreseeable future. PPC is currently the largest independent producer of electricity in Slovakia with a total installed capacity of 218 MWe. Its annual production reaches 1,200 GWh of electricity, which accounts for 3.5% of the total electricity production in Slovakia. PPC was established in 1998 by three at that time state-owned companies – ZSE, gas utility SPP and SE. The power plant was constructed by German Siemens at a total cost of DEM 170m and the project was financed by a credit from European Investment Bank with a state guaranty. The provision of state guaranty signaled a lack of interest of commercial banks to finance it because they considered the project to be too risky. Besides, the founders of PPC were forced to make long-term contracts to supply natural gas (SPP), purchase electricity (SE) and heat (ZSE). These contracts turned to be non-profitable for SPP, SE as well as the heating plant Bratislavská teplarenska (it has been separated from ZSE to an independent company). Following a fruitless two-year long search for a potential investor, PPC's owners transferred their stakes to the privatization agency FNM.

Privatization of Paroplynovy cyklus

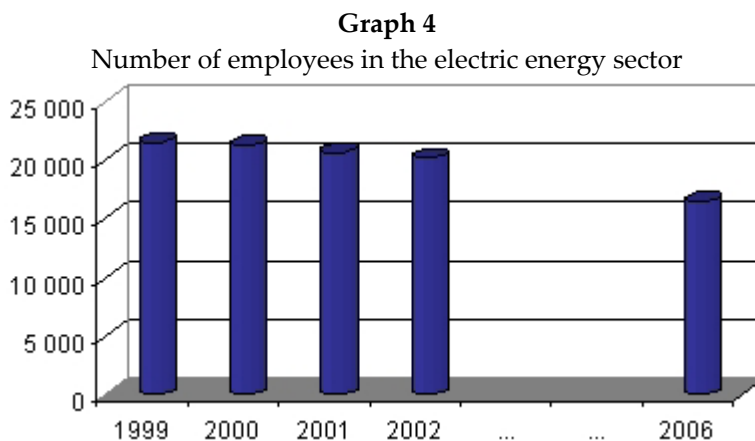
Now it is the FNM, which is attempting to find an investor for PPC. The potential buyer will have to take over the guaranty of credit from EIB and to increase the basic capital of PPC. Another problem is the existing long-term contracts of PPC on the supply of heat for Bratislavská teplarenska and electricity for SE. The regulatory body URSO has accepted the long-term contract of PPC and SE as a kind of stranded costs, which limits SE competitiveness in the open market. Moreover, the situation is currently complicated by the existing legal case between PPC and Bratislavská teplarenska, related to the fulfillment of contractual obligations to supply heat. Thus, the date of PPC privatization is still unclear but it is expected to start this year.

Labor market and EU accession

Liberalization of the Slovak electricity market and its integration to the single electricity European market will strongly affect the labor market in the electric energy sector. At present, all formerly state-run companies in the sector are characterized by relatively high over-employment (which is typical for all former state companies). New foreign owners of three distribution companies as well as the future owner of SE will carry out inevitable steps to increase effectiveness and labor productivity. This will be accompanied by payroll cuts. However, these painful cuts will be partly outweighed by the arrival of new independent power producers. New jobs will also be created in areas such as electricity trading and consulting services. In spite of that, the overall employment in the sector will fall from the current 20,000 employees to about 16,000 – 17,000 employees in 2006. We anticipate that the entry of Slovakia into the EU will have only a slight, if any, impact on the migration of labor force in the electric energy sector.

Employment in the sector has been falling moderately so far

At present, the electric energy sector employs some 20,000 people, about 1.5% of all people employed in the Slovak economy. More than 85% of all employees in the sector work for SE, SEPS or the three distribution companies. Up to 2002, all large companies in the electric energy sector were owned by the state and decisions to lay off redundant staff have been postponed due to political reasons. As a result, the number of employees in the sector has been falling only moderately in the past years. Therefore the sector still suffers from high over-employment.



Source: Statistical Office; graph: Symsite Research

SE is the largest employer in the sector

The largest employer in the electric energy sector is by far the dominant producer SE with 9,700 employees, which represents more than a half of the total staff in the sector. A significant drop in the SE payroll to 9,700 in 2002 (2001 11,127) was caused by the transformation of SE prior to its privatization, when the heating plant Teplaren Kosice and transmission grid operator were separated from the former SE. However, some of SE's employees have also been laid off in 2002. Distribution companies ZSE and SSE had about 2,500 employees each at the end of 2002, followed by the distribution company VSE with 2,000 employees. In the past two years, the payrolls of ZSE and SSE shrank by more than 1,000 employees, following their transformation and the separation of some heating plants. The transmission grid operator SEPS, which was established in January 2002, employs 360 people. The rest of the employees are employed by independent power producers (PPC or Vodne dielo Zilina), heating plants, which also generate some electricity, and some suppliers of the electric energy sector.

Table 15

Number of employees in major companies in the electric energy sector at the end of period

	1997	1998	1999	2000	2001	2002
Slovenske elektrarne	11,470	11,246	11,313	11,370	11,127	9,693
Zapadoslovenska energetika	3,757	3,761	3,638	3,617	2,571	2,500
Stredoslovenska energetika	3,670	3,667	3,661	3,570	3,541	2,482
Vychodoslovenska energetika	2,076	2,087	2,063	2,066	2,041	2,001
SEPS*	-	-	-	-	-	360
Total	20,973	20,761	20,675	20,623	19,280	17,036

Source: SE, ZSE, SSE, VSE, SEPS

*The transmission grid operator SEPS was established at the beginning of 2002 after its separation from SE

About 20% of employees are redundant in the distribution companies

Managers in distribution companies estimate that approximately 20% of their employees are redundant. That means that about 1,500 employees will lose their jobs there in next few years. Foreign investors to distribution companies have already claimed that it is necessary to lay off redundant staff in order to increase labor productivity and competitiveness. ZSE plans to cut its payroll of 2,500 employees by about 10% in 2003; however, more lays off are planned in next years. Staff reductions by about 20% are also planned in two other distribution companies – SSE and VSE. The dominant producer SE is also characterized by significant over employment but SE management refuses to give its estimates. The excess of employees in SE is remarkable when we compare employee numbers in SE with its Czech counterpart CEZ. CEZ is also the dominant producer of electricity in the Czech Republic with total electricity production of more than 52,200 GWh in 2001, which is almost double SE production. CEZ had 7,552 employees at the end of 2001 in comparison with 9,693 SE employees at the end of 2002. The employee numbers are not entirely comparable because of different structure of installed capacities and the degree of outsourced activities. Still, they show that number of redundant employees in SE may be higher than 30%. This means that 3,000 or so jobs will be shed after SE privatization.

More staff reduction is to come after the shutdown of some generation facilities

More job cuts are to come after the planned shut down of two blocks in nuclear plant V-1 in Jaslovske Bohunice in 2006 and 2008. According to SE managers, all of their 1,144 employees will lose their jobs after the shutdown. Besides, the closure will also affect suppliers of the nuclear plant, which will have to shed another 2,000 jobs. Up to 2010, more reductions in employee numbers are expected in Novaky, where some obsolete blocks should be decommissioned. Likewise, the integration of the Slovak market into the single European market with electricity may cause shutdowns of other plants as well. On the other hand, the arrival of new independent power producers to the Slovak market will bring in new job opportunities. An example is the planned construction of CCGT cycle in Malzenice by Swiss investor Advanced Power as well as the joint project of Advanced Power and the local mining company in Novaky. The plant should gradually replace the old thermal power station, which should be shut down over the next ten years. The establishment of a system operator and possibly electricity exchanges will also create new jobs in the field of consulting services and electricity trading. However, these new job opportunities will fall short of outweighing the payroll cuts that are expected in privatized energy firms. New power stations in Malzenice and Novaky will bring only a couple of hundred jobs, which is far below the number of lays-off.

Migration of labor force after EU entry

The entry of Slovakia into the EU in May 2004 will not increase the emigration of labor force out of the sector since most current EU members will require a temporary period of seven years for the free movement of labor force, with the exception of Great Britain, Ireland, Holland, Denmark and Greece. As the electric energy sector belongs to traditional industries, the demand for its employees is lower in EU countries than for other qualified professions like IT experts. However, foreign owners of Slovak electric energy companies may promote training or offer job opportunities to some Slovak employees in EU countries. Some job opportunities in EU countries may also arise for highly qualified experts in the field of electric engineering. However, this will apply only to a very limited group of employees. Similarly, we do not assume any high immigration of labor force from EU to the electric energy sector in Slovakia with exception of managerial employees who will likely possess top positions in companies of the sector. The reason is the still high unemployment rate in Slovakia (about 17.5% at the end of 2002) and subsequently much lower average wages in comparison with wage levels in EU countries. In coming years, the supply of labor exceeding demand will still dominate in the electric energy sector. Any future lack of skilled candidates for vacant jobs in the sector is not likely because the present education system in Slovakia ensures sufficient numbers of graduates educated or apprenticed in the field of electric engineering.

Effects of EU accession on labor market in the electric energy sector	
Supply side effects <ul style="list-style-type: none">• New job opportunities will arise after construction of new power plants and arrival of independent power producers• Some highly skilled employees may find jobs in EU countries• Establishment of system operator (possibly electricity exchange) and development of consulting services will bring in new job opportunities for a limited group of highly qualified staff	Demand side effects <ul style="list-style-type: none">• Reduction in employee numbers due to current over employment and intentions to increase labor productivity and competitiveness• Shutdown of V-1 nuclear plant in Jaslovske Bohunice and obsolete blocks in thermal plant Novaky will cut SE's payroll• Foreigners appointed by foreign shareholders will hold top positions in companies of the electric energy sector

Employment in the sector may fall to as low as 15,000 in 2008

We expect that the total number of employees in the sector will thereby fall to about 16,000 – 17,000 in 2006. After the shut-down of two blocks in the power station V-1 in Jaslovske Bohunice, the number of staff may fall even further, to 15,000 in 2008. However, if a foreign investor in SE chooses to complete the nuclear power station in Mochovce, or to build other generation facilities, the size of job cuts might be lower.

The effect of EU accession on the regulatory framework

Slovakia has already successfully adopted most of the principles included in EU Directive No. 96/92 on Energy, which relates to the unbundling of network industries and the creation of a competitive environment in the electric energy sector. At present Slovak legislation enables access to network for independent power producers and regulates all subjects in the sector on a non-discriminatory basis. All of these aspects are already included in the Law on Energy No. 70/1998 and its later amendments; yet, some legislation norms concerning rules for system operator and electricity trading are to be passed in the near future. Prior to the new regulatory framework, network industries were regulated by the Ministry of Economy, which was issuing permissions for construction of new power plants, as well as by the Ministry of Finance, which regulated electricity prices. The previous regulatory framework, which lasted to the end of 2001, had several serious deficiencies. The prices of electricity were increased at a very slow pace during 1990s, as politicians were avoiding politically sensitive measures. Thus, electricity prices did not even cover real costs of generation, transmission and distribution and the structure of tariffs was characterized by deforming cross-subsidies.

The electric energy sector is regulated by an independent body - URSO

The process of liberalization and privatization in the electric energy sector has brought a need to establish an independent regulatory body over the electricity market. On June 21, 2001 the Slovak Parliament passed Law No. 276/2001 on Regulation of Network Industries, which established an independent regulatory body URSO. It started its activities in January 2002. The main role of URSO is to promote efficient and reliable operations of network industries and balance interests of both suppliers and consumers. Its major jurisdictions include:

- issuance or deprivation of permissions to do business in areas of production, transmission and distribution of electricity, natural gas and heat,
- approval of permissions for construction, reconstruction and shutdown of facilities that serve to carry out regulated activities,
- permissions to enter the network for entities that produce, transmit and distribute of electricity, natural gas and heat,
- regulation of prices of products and services in the energy industry.

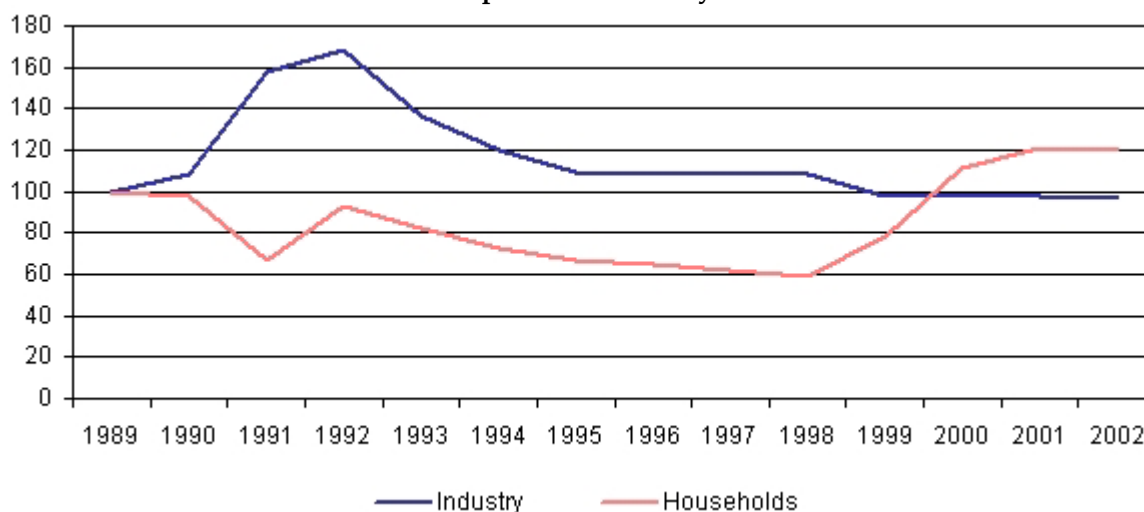
Regulation of electricity prices

Effective on January 1, 2003, URSO commenced regulating the maximum prices of electricity, natural gas and heat. The basic principle of regulation is that the maximum prices or tariffs are based on justified costs and appropriate profit of regulated subjects. In the electric energy sector, this applies especially to prices of transmission and distribution of electricity because the transmission and distribution networks are considered to be so-called natural monopolies. Since the electricity market in Slovakia is not fully open yet (in 2003 the legitimate customers are those with annual consumption exceeding 40 GWh), URSO differentiates between legitimate and so-called protected customers. At present protected customers include households and those legitimate customers who do not use their right to choose a supplier of electricity. URSO regulates the maximum prices of electricity transmission and distribution for legitimate customers and sets maximum prices of electricity for protected customers. In 2003, URSO also regulates the maximum price of power electricity generated by SE because of its current dominant position in electricity generation. However, this particular regulation will likely cease in 2004, when the degree of liberalization will increase and the electricity market will become more competitive.

Prices of electricity for households rose less sharply in the 1990s than for industry

After political changes in 1989, major legislative changes took place concerning the protection of the environment. Such legislation called for major investments in programs for reducing emissions from thermal power stations, which led to increased expenses for producers of electricity. These expenses were one of the chief reasons for the gradual increase in electricity prices. From 1993 to 1998, energy prices were increased only to a minimum degree due to political reasons (the popularity-seeking government of Vladimir Meciar preferred short-term political gains), which together with existing inflation expressed itself as a drop in real prices. Following the arrival of the new government in 1998, another reason for adjusting energy prices arose with Slovakia's accession hopes to the EU. Together with the necessity to resolve the problematic financial situation in Slovenske elektrarne, the government launched a series of electricity price increases in 1999-2001, whereby the average growth in prices for organizations was lower than that for households. In 2002 the government of Prime Minister Mikulas Dzurinda gave up increasing electricity prices because of the parliamentary elections which took place in September 2002. In real terms, the average prices of electricity for industrial companies in 2002 were approximately the same as in 1989, while the average prices for households were only 20% higher than in 1989 (see graph 5).

Graph 5
Index of real prices of electricity (1989 =100)



Source: URSO

A sharp hike of electricity prices in 2003

Despite hikes in electricity prices in the period 1998 – 2001, the average prices in 2002 did not still reach the real costs of production, transmission and distribution of electricity and there were still cross subsidies among particular groups of customers, i.e. households heated by electricity. Effective on January 1, 2003 the prices of electricity for households rose on average by 24.7% while the prices of electricity for businesses were raised on average by 20%. According to Jan Matusky, the chairman of URSO, the hike in electricity prices in 2003 was sufficient and at present the prices cover real costs and moderate profit of energy companies. Cross subsidies have been removed. The only exception is the price for households supplied by the distribution company Stredoslovenska energetika (SSE). The price of SSE still does not cover real costs and retains cross subsidies, but this should be removed in 2004 according to Jan Matusky. The different approach to setting prices for SSE relates to its different structure of the distribution system and consumers of electricity. In the case of the two other distribution companies and prices for businesses, the electricity prices will be increased only by the rate of inflation over the next couple of years.

Regulation of electricity prices is different for protected customers—

The regulation of maximum electricity prices for protected customers is based on several factors – so-called manageable and non-manageable costs, correction factor and influence of unexpected changes of costs. The non-manageable costs of a distribution company include all the prices of electricity based on contracts with electricity producers, costs of electricity distribution as well as costs for the system and support services. The manageable costs include exactly defined economically entitled costs like depreciation, wages, costs of own consumption of electricity and appropriate profit of a distribution company. The correction factor reflects the need to balance lack or surplus of income of a distribution company in the previous regulation period because the regulation is based on future assumptions, which do not have to fulfill. Similarly, the regulation formula includes unexpected changes of costs, which represents a certain protection against extraordinary events. This price regulation applies to all protected customers except households, i.e. it applies to those businesses, which do not belong to legitimate customers yet, or they did not use their legitimacy to choose their own producer of electricity. Each year, the distribution companies submit a proposal of their electricity tariffs for protected customers to URSO, which has to approve them.

—households—

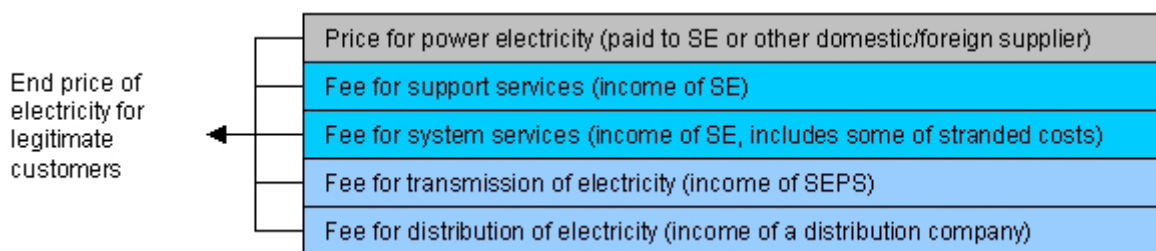
The price regulation for households is a little bit different from other protected customers because the annual rise in electricity price for households set by a distribution company cannot exceed (by law) the four times inflation rate measured in the previous year by the Statistical Office. The maximum price of electricity for households in 2003 differs among the three distribution companies in Slovakia. The costs of electricity distribution in these companies vary because of differences in distribution system and structure of consumers. Each year, distribution companies have to submit proposal of tariffs of electricity for households to URSO, which has to approve them.

—and legitimate customers

In liberalized markets, legitimate customers can choose among various producers of electricity, who compete with one another. The state regulation applies only to maximum prices of electricity supply through electric lines of a distribution company and transmission grid operator. URSO set such a price for electricity supply to cover entitled costs and appropriate profit of distribution companies. Thus, the end price of electricity for a legitimate customer consists of several components – the price for power electricity, fee for system costs and support services, fee for distribution and fee for transmission of electricity. Legitimate customers can purchase power electricity from SE at a maximum price of Sk 1,272 per MWh (EUR 30) or from other independent power producers. Regulated fee for system costs in 2003 also involves compensation of some of SE stranded costs⁸. Except for the stranded costs, costs of system also include price for regulation of balance of load in the Slovak electricity network. Fees for system costs and support services are collected by distribution companies, which transfer them to transmission grid operator SEPS. Subsequently, SEPS transfer these fees to SE, which is able to provide system and support services.

⁸ Fee for system services for 2003 involves long-term contract on purchase of electricity from Paroplynovy cyklus, burning of lignite from Hornonitrianske bane Prievidza and legal contribution of SE to State Fund for Decommissioning of Nuclear Energy Facilities.

Diagram 3
Composition of end price of electricity for legitimate customers



Source: URSO

New regulatory period will commence in 2006

The principles and formulas of the actual price regulatory framework will remain valid till the end of 2005. The second regulatory period will commence in 2006, when URSO will reevaluate again price its regulation system for protected customers, as well as prices for supply of electricity for legitimate customers. In 2006, URSO will also reassess the amount of manageable costs on the basis of analysis of entitled costs and appropriate profit, while taking into consideration reproductive value of regulated subjects' assets. The regulation period is three years because investors in the electric energy sector must have an assurance that the valid regulatory framework will not change over a defined period. The stability of regulatory framework is essential for making long-term investment decisions.

Consequences of new regulatory framework for the electric energy sector

New regulatory framework has significant consequences for the electric energy sector. Prices have already risen to a level that covers real costs of production, transmission and distribution of electricity and cross-subsidies to some groups of consumers have been mostly removed. This will lead to economic and financial stabilization of regulated subjects, which should be able to accumulate sufficient resources to invest in modernization of obsolete distribution and transmission networks. Liberalization of electricity market and free trading with this commodity should push electricity prices down in the medium run. Another consequence of liberalization and the new regulatory framework will likely be the decrease in production of electricity in SE in favor of other domestic and foreign independent power producers.

Consequences of new regulatory framework
<ul style="list-style-type: none"> • Transparent regulation • Financial stabilization of regulated subjects • Removal of cross-subsidies and deregulation of electricity prices

What changes in regulatory framework can be expected?

In future, some changes in the position of URSO can be expected. Representatives of some local industrial companies, which suffered from a hike in electricity prices in 2003, have criticized the fact that at present it is not possible to appeal against URSO resolutions concerning price regulation in the electric energy sector. The Slovak government shall deal with their objection and it may decide to change the mechanism of how prices are set. Moreover, an amendment to the Law on Energy is planned for 2003, which should define precise rules for electricity trading and for activities of system operator. The government also plans to approve an

amendment to the Law on privatization, which would allow the sale of majority stakes in the electric energy companies.

The effect of EU accession on the market structures

The full liberalization of the electricity market in Slovakia in 2005, as an outcome of the EU accession process, will greatly increase competition on the Slovak electricity market. SE, as a dominant producer of electric power at present, will have to face both the competition of domestic independent power producers and foreign producers of electricity. SE is in a more difficult position when compared to other electricity producers in the EU. It inherited high debts, stranded costs and low effectiveness from the state, its owner. The high indebtedness of SE stems above all from huge investments that were not accompanied by inevitable the deregulation of electricity prices. Therefore, the successful privatization of SE and its further competitiveness in a liberalized EU market will require an appropriate compensation of stranded costs by the state. Consequences of the previous state regulation of the electric energy sector also relate to distribution companies. They did not generate sufficient profits in 1990s to modernize distribution networks and some of them are obsolete at present.

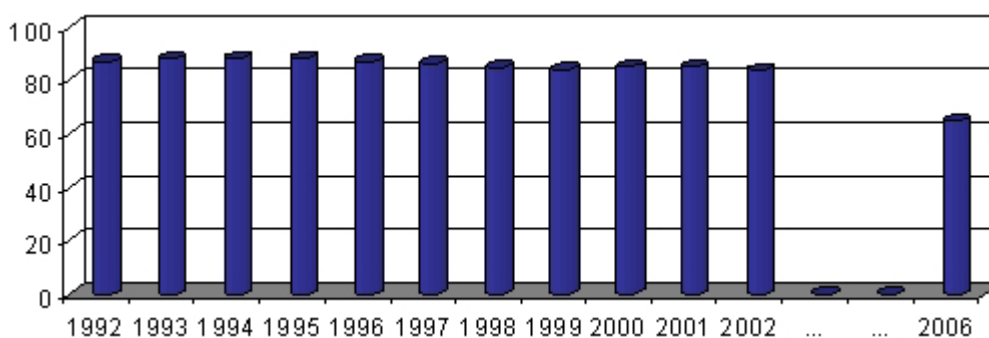
The share of SE in total production of electricity will decrease in future years

SE is a dominant producer of electricity in Slovakia with a share of 79.8% of the total production of electricity in Slovakia in January 2003. That represents a slight drop in comparison with the share of 83.6% in 2002. In January 2003, the Slovak electricity market was opened to foreign countries, when legitimate customers are allowed to import one third of their annual consumption of electricity from abroad. The decline of SE production in January 2003 was also caused by the import of electricity by ZSE and SSE through their own 110 kV lines to some areas in western part of Slovakia. These are in a so-called island operation, being supplied by CEZ and regulated by the Czech transmission grid operator CEPS. Since the current price of power electricity in dominant producer CEZ is about 10-15% lower than the price of SE, we expect that the share of SE in total production (and consumption) will decrease in future years. The preservation of SE dominance will depend on the way stranded costs are compensated for, on the outcome of privatization, as well as on its ability to increase competitiveness. We assume that the SE share in total energy production in Slovakia may fall to 65 – 70% in 2006 in favor of independent power producers in Slovakia (e.g. the CCGT cycle in Malzenice). SE's ability to compete on the EU single electricity market will be strongly affected by the method of compensation for stranded costs and by its privatization. Therefore the volume of production in SE in future years will strongly depend on implementing a few important steps:

- state compensation for existing stranded costs of SE,
- successful privatization of both nuclear and other assets of SE,
- increase in the effectiveness of production in SE and rationalization of internal processes,
- considerable reduction in costs and labor force,
- possible closures of the least effective production facilities and maximum usage of the most efficient ones.

Graph 6

Development of SE's share in total production of electricity in Slovakia (%)



Source: Slovenske elektrarne; graph: SymSITE Research

The liberalization will mostly affect the electricity generated in nuclear power plants

At present SE operates three groups of power generators – nuclear power plants, thermal power plants and hydroelectric power plants. Nuclear power plants operate at base load, with thermal power plants in the regulation regime. The peak consumption of electricity is covered by run-off-river power stations and pump storage power stations. The opening of the internal electricity market to foreign countries will increase imports of electricity, leading to lower production by SE, especially in the power plants operating in base load (nuclear power plants). Importantly, nuclear power plants are the cheapest sources of energy (have the lowest variable costs), and their lower usage will increase the average production costs of SE. This will turn into lower profitability and ability to repay debts.

SE production will be affected by the shut down of two reactor blocks in Jaslovske Bohunice—

A significant cut in SE production will probably occur in 2006 and 2008, when two reactor blocks of Jaslovske Bohunice nuclear power station (each one with an installed capacity of 440 MW) will be shut down and decommissioned. Slovakia obliged itself to shut them down during the negotiation process with EU. The government has already made a contract with the European Bank for Reconstruction and Development (EBRD) on the creation of a fund for their decommissioning. The EBRD has obliged to provide a credit of EUR 150m to part-finance the costs of shutdown. In 2002 four reactors of Jaslovske Bohunice produced 12,083 GWh of electricity, which represented 36.8% of total production of electricity in Slovakia. The shut down of two reactors will cut the output of Jaslovske Bohunice's power station by half. This fall in production could be balanced by the completion of two partially built reactor blocks in Mochovce (each one with an installed capacity of 440 MW). However, this is not very likely since no participant in the SE privatization tender has announced an interest in purchasing the nuclear assets. The government has already declared that it would not spend state money to complete the reactors, while allowing any private investor to do so. Moreover, the compensation of stranded costs in 3rd and 4th block of Mochovce plant will likely require the formal termination of this project.

—shutdown of two conventional blocks—

Besides, two obsolete blocks in Novaky with total installed capacity of 110 MW are planned to be decommissioned in 2006. However, this particular cut in production should be compensated for by a new thermal power plant, which a Swiss investor in cooperation with local mining company plans to build (see below).

—and by the arrival of new producers

The arrival of foreign direct investments in the electric energy sector will affect the volume of production in an opposite direction. The consortium of Swiss investor Advanced Power and German Siemens plans to build a new CCGT plant located in Malzenice, near Jaslovske Bohunice, with an installed capacity of 385 MW, which should be completed by the end of 2004. This power station aims to generate around 3,000 GWh of electricity yearly. Another project is a thermal power station drafted by consortium of Advanced Power and local mining company Hornonitrianske bane Prievidza. The construction of new thermal power station, which will burn lignite from local mines, should start in 2004 and finish in 2008. The projected installed capacity of 270 MW should generate about 2.000 GWh of electricity per year (see the section "FDI flows in the electric energy sector" for more information on these projects). Moreover the Ministry of Economy has already issued licenses to build a few more CCGT plants with total installed capacity of 300 – 380 MW. These new power plants are likely to replace the decommissioned reactors in Jaslovske Bohunice.

Some domestic companies consider construction of CCGT plants as well

Besides Advanced Power, some domestic companies consider investments into CCGT plants as well. The Ministry of Economy has already issued licenses to build energy facilities with a total installed capacity of 300 MWe – 380 MWe (see Table 16). None of these projects have been launched yet, although some of them have already been given building permissions. For instance, Prva paroplynová spoločnosť j.s.c., a joint venture of local Istroenergo Group and gas utility SPP, plans to build two CCGT plants in the areas of compressor stations in Jablonov and Velke Kapusany. At present the projects are in the phase of feasibility studies. The installed capacity of these CCGT plants should be 20-50 MWe (Jablonov) and 27-80 MWe (Velke Kapusany), respectively.

Table 16

List of licenses for construction of energy facilities, which has been approved by Ministry of Economy
MWe, MWt

Company	Type of energy facility and installed capacity	Place
Slovenska energeticka spolocnost, j.s.c.	CCGT, 200 MWe	Lucenec
MSM, Ltd.	CCGT, 40 MWe	Svidnik
Hornonitrianske bane, j.s.c.	Heating plant, 45 MWt, 8 MWe	Handlova
Prva paroplynová spoločnosť, j.s.c.	CCGT, 20 – 50 MWe	Jablonov
Prva paroplynová spoločnosť, j.s.c.	CCGT, 27 – 80 MWe	Velke Kapusany

Source: Ministry of Economy

Structure of electricity generation in Slovakia in 2002

Jaslovske Bohunice nuclear power plant accounted for 36.8% of the total electricity production in Slovakia in 2002 (12,083 GWh of electricity). The nuclear power station in Mochovce came second, with 5,870 GWh and 17.9%, respectively. The thermal power stations in Vojany and Novaky produced 4,269 GWh of electricity (13%) and SE's hydroelectric power stations 5,168 GWh (15.7%). The independent producers of electricity in 2002 included a CCGT plant Paroplynový cyklus Bratislava (1,151 GWh), heating plants⁹ (959 GWh) and hydroelectric power station Vodne dielo Zilina (185 GWh). A significant part of total production of electricity was carried out by auto-producers, which generated 3,129 GWh representing a share of 9.5% (see Table 17).

⁹ Including the heating plant Tepelna energetika Kosice

Table 17
The production of electricity by producers in 2002
GWh, %

Production facility	Volume of production	Share
SE – nuclear power station J. Bohunice	12,083	36.8
SE – nuclear power station Mochovce	5,870	17.9
SE – thermal power station Novaky	1,880	7.3
SE – thermal power station Vojany	2,389	5.7
Tepelna energetika Kosice ¹	55	0.2
SE – hydroelectric power stations	5,168	15.7
SE total	27,445	83.6
Paroplynovy cyklus Bratislava (CCGT plant)	1,151	3.5
Hydroelectric power station Vodne dielo Zilina	185	0.6
Tepelna energetika Kosice ²	375	1.1
Other heating plants	529	1.6
Distribution companies ZSE and SSE	17	0.0
Plant power stations (auto-producers)	3,129	9.5
Slovakia total	32,830	100.0

Source: Slovenske elektrarne, Symsite Research

¹Tepelna energetika Kosice was separated from SE on January 21, 2002

²From January 21, 2002

Installed capacities

Table 18 shows that the highest installed capacities of the Slovak electricity producers is currently in thermal power stations (3,177 MW) and the lowest in hydroelectric power stations (2,474 MW). The present installed capacities of two nuclear power stations, at 2,640 MW, would increase to 3,520 MW in case of completion of 3rd and 4th reactors in Mochovce plant. On the contrary, the shut down of two reactors in Jaslovske Bohunice will cut installed capacity by 880 MW and the closure of two blocks in Novaky plant will decrease it by another 110 MW. However, these cuts will be balanced by new generation facilities that are to be built. At present, the total installed capacities of SE reach 6,998 GWh, which represents 84.4% of total installed capacity in Slovakia.

Table 18
Installed capacities of power stations in Slovakia for 1999-2001
MW

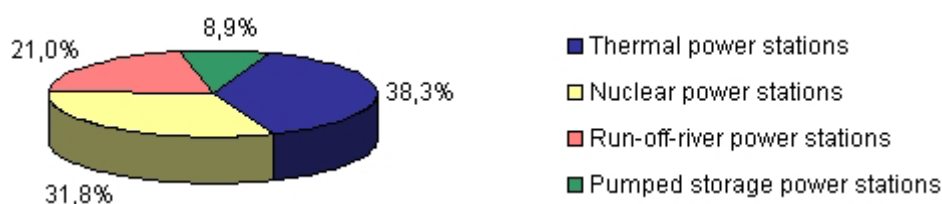
Type of power station	1999		2000		2001	
	Slovaki a	SE	Slovaki a	SE	Slovaki a	SE
Nuclear power stations	2,200.0	2,200.0	2,640.0	2,640.0	2,640.0	2,640.0
Thermal power stations	3,168.6	1,963.4	3,163.1	1,963.4	3,177.1	1,963.4
Run-off-river power stations	1,736.5	1,657.9	1,738.8	1,660.2	1,738.8	1,660.2
Pumped storage power stations	735.1	735.2	735.2	735.2	735.2	735.2
Total	7,840.3	6,556.5	8,277.1	6,998.7	8,291.0	6,998.7

Source: Slovenske elektrarne

Capacity of thermal power stations is not fully used

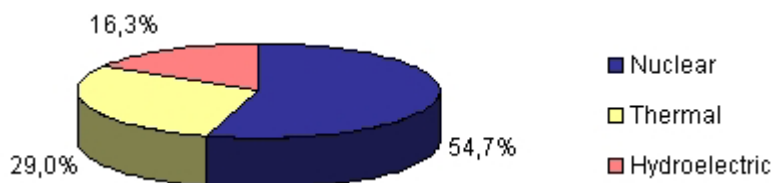
When comparing installed capacities and actual production, we see that most power produced (54.7% in 2002) comes from nuclear power stations (for SE alone this figure is as high as 65.4%), although they only account for 31.8% of the installed capacities (for SE alone 37.7%). This difference is caused by the low price of energy produced by nuclear power plants, low available output of hydro-electric power plants in comparison with their installed capacity, as well as the low output of thermal power plants as a result of a relative surplus of electricity on the Slovak market and the seasonal nature of consumption. This leads to the conclusion that even the currently installed capacities allow for a significant increase in electricity production if the need arises (following either raise in demand or seasonal factors).

Graph 7
Share of installed capacities in Slovakia in 2002



Source: Slovenske elektrarne; graph: Symsite Research

Graph 8
Production of electricity in Slovakia by power plants in 2002



Source: Slovenske elektrarne; graph: Symsite Research

Auto-producers of electric energy in Slovakia

Auto-producers generate electricity on own power generators predominantly for their own consumption. They produced 3,129 GWh of electricity in 2002 (9.5% of the total production of electricity). The auto-producers include mainly industrial companies operating in energy-demanding industries such as the manufacture of steel, aluminum, chemicals, wood pulp and paper. The volume of electricity generated by auto-producers has been increasing slightly over the last decade - from 2,300 GWh in 1993 to more than 3,100 GWh in 2002. Table 19 shows the list of currently largest auto-producers with their installed capacities.

Table 19
Largest auto-producers of electricity and heat in Slovakia
MW

Company	Locality	Branch	Capacity (MW)
U.S Steel	Kosice	steel	193
Slovnaft	Bratislava	chemicals	114
Kappa Sturovo	Sturovo	wood pulp, paper	50
Duslo	Sala	chemicals	46
Chemko	Strazske	chemicals	43
Bukoza	Vranov nad Toplou	wood	40
SCP Ruzomberok	Ruzomberok	wood pulp, paper	36
ZSNP Ziar nad Hronom	Ziar nad Hronom	aluminum	33

Source: auto-producers

Liberalization of electricity market in Slovakia—

In order to be efficient, an auto-producer must be able to sell its electricity surplus to the electricity network. Electricity consumption in the production varies with time, while the generators are not able to adjust to it immediately. At present, all auto-producers of electricity with an installed capacity higher than 5 MW have to obtain a license for operating a generation facility from the regulatory body URSO. The former regulation method did not grant auto-producers access to distribution networks on a non-discriminatory basis. The only option of putting surplus electricity on the market was to sell it to distribution companies or to Slovenske elektrarne. However, the price these companies offered auto-producers was mostly greatly under the level of prices at which industrial companies purchased electricity.

—brings new chances for auto-producers

The liberalization of the electricity market has brought new opportunities for auto-producers as well. They are able to sell their surplus of electricity to legitimate customers or through electricity traders in future. A legitimate consumer has to pay a distribution company and a transmission grid operator for the supply of electricity via electric lines. In 2003, there are only some 40 legitimate customers in Slovakia, but their number will grow.

A profitability of the construction of new company power plants will depend mainly on the development of electricity prices and of fossil fuels prices (coal, natural gas). After a sharp hike of electricity prices for businesses on average by 20% in 2003, we expect the prices to increase only by the inflation rate in future years. In the long term, the positive effects of liberalization and privatization can even push the prices down as some western European countries have already experienced. In coming years we expect rising interest especially for CCGT plants, at places where demand exists for both electricity and heat. At present more than 100 CCGT units are installed in Slovakia, which mostly generate electricity for private entities. Their installed capacity is relatively small, ranging from several kilowatts to a few megawatts.

The effect of liberalization on distribution companies

The three distribution companies are natural monopolies, which means that they will be affected by state regulation rather than by competitive forces in the liberalized electricity market. The new regulatory framework, which sets prices of electricity transmission and distribution on the basis of entitled costs and appropriate profit, should generate sufficient profits for distribution companies as well as transmission grid

operator to invest in modernization of distribution system. Concerning possible mergers in the sector, we do not assume that they will take place on the local level because the three distribution companies in Slovakia have different foreign owners (E.ON, RWE, Electricite de France). The same holds true for future owners of SE, which will be some of the major European players in the electric energy sector. Therefore the mergers of companies will stem from mergers of their parent companies. The consolidation of public utilities has become a trend in EU countries in past years. An example is the acquisition of British Powergen by German E.ON, or the planned merger of E.ON and Ruhrgas. However, all mergers will be subject to approval by the European Commission.

Enhanced competition in liberalized EU market will mostly affect SE

The companies in the electric energy sector will have to implement some unavoidable steps needed to enhance their competitiveness. However, SE's ability to compete on international markets will strongly depend on the state's compensation for stranded costs. The inheritance of state investments, slow deregulation of prices and inappropriate contracts is a heavy burden on SE's economy and it is the main reason why SE cannot offer lower prices of power electricity than its Czech competitor CEZ. The stranded costs also have a negative impact on SE's structure of costs, of which financial costs make up about 25%. This is much higher value than 10.5% (in 2001) in the case of CEZ. The lack of a system operator in the market also hampers the possible decline in the price of SE's power electricity. SE has to generate peak-load electricity, which is the most costly, because SE is the only subject in Slovakia able to provide system and support services. If the system operator is established, SE will be able to differentiate the price of power electricity to several bands, as CEZ does today. The consumers would make contracts with SE on the basis of their consumption plans - they would pay lower prices for planned stable consumption and higher prices for peak-load consumption. At the same time they would compensate for differences in consumption during the year. Thus the establishment of a system operator should bring lower prices of SE electricity and make it more competitive in saturated electricity EU markets.

Generation capacities of SE

Nuclear power plants

At present, SE operates six nuclear reactors in two nuclear power plants Jaslovske Bohunice and Mochovce. They are of old Soviet type VVER and each one has an installed capacity of 440 MW. The 3rd and 4th reactor blocks of nuclear power plant Mochovce have not been completed and they should be acknowledged as stranded costs of SE. Given the obsolete technical conditions of two reactors in Jaslovske Bohunice V-1 plant, SE upgraded them to increase their safety in 1990s. Later on, the Slovak government signed an agreement with the EU to shut down the two blocks in V-1 in 2006 and 2008, respectively. The remaining two blocks should operate up to 2015. The nuclear power plant in Mochovce (two blocks) was put into full operation in 1999. In 2002, Jaslovske Bohunice plant generated 12,083 GWh of electricity; nuclear power station Mochovce 5,870 GWh.

Conventional (thermal) plants

The total installed capacity of thermal plants in Slovakia represents 3,177 MW today, of which SE's installed capacities make up 1,963 MW. The rest are conventional power generators in some industrial companies, heating plants and Paroplynovy cyklus. SE operates two thermal power stations – in Novaky and Vojany. The Novaky power plant has an installed capacity of 522 MW and except for the generation of electricity (1,880 GWh in 2002) it also supplies heat to surrounding municipalities. The turbines in Novaky power plant use brown coal from the mining company Hornonitrianske bane as fuel due to the government's policy that supports local mining. Two blocks of this power plant with installed capacity of 110 MW are to be shut down in 2006. The thermal power plant in Vojany has an installed capacity of 1,320 MW and it generated 2,389 GWh of electricity in 2002. It uses black coal, natural gas and oil as fuel. Thermal power stations in Novaky and Vojany produce electricity at higher costs in comparison with other SE's generation facilities.

Hydroelectric power plants

The total installed capacities of SE's hydroelectric power plants amount to 2,395 MW, which represents 97% of total installed capacities of hydroelectric power plants in Slovakia. Most of the plants are situated alongside the river Vah, including the only pumped storage power station (installed capacity of 735 MW) in Slovakia. In the basin of the Danube River, the largest installed capacity (720 MW) is in the water dam Gabčíkovo. The Gabčíkovo hydroelectric plant cannot be privatized because the Slovak-Hungary agreement on construction of water dams Gabčíkovo-Nagymaros does not permit that. Therefore the Gabčíkovo plant has to be excluded from SE's assets prior to its privatization. The rest of the hydroelectric power plants are situated in eastern Slovakia and their installed capacity is some 100 MW. Then there is also an independent power producer – state owned hydroelectric power plant Vodné dielo Zilina with installed capacity of 72 MW as well as about 60 private small hydroelectric water plants with total capacity of 7 MW. The hydroelectric power plants in Slovakia produced 5,353 GWh of electricity in 2002.

Performance of the electric energy sector

Financial results of the electric energy sector are improving

After 1998 and 1999, when the Slovak electric energy sector suffered high losses (the total loss in 1999 was as high as Sk 2bn or EUR 50m), the situation has been slightly improving. In 2001, sales of the energy sector amounted to Sk 90.009bn (EUR 2.1bn), which in comparison with 2000 is a rise of 12.7% and compared with the 1998 33.8%. It is typical for the sector that sales grew substantially quicker than the volumes of produced electric power, this was due to hikes in electricity prices in 2001. The consumption of electricity in 2001 rose only slightly – by 0.4% y/y. In 2003, this trend should continue because of deregulation of electricity prices, effective from January 1.

The profitability of the electric energy sector rose in 2001

Table 20 shows that the sector's performance sharply improved from 2000 onwards. Causes of losses within the sector in 1998 and 1999 can be found in increased financial costs, more specifically in high financial costs and high currency exchange losses due to the enormous growth in the volume of loans drawn by energy concerns in foreign currencies. Such an increase in the loan burden was as a result of increased investment activities in 1998 (investment shot up from Sk 15.776bn in 1997 to Sk 36.751bn in 1998). Increased loans were required chiefly for the completion of blocks 1 and 2 of Mochovce. However, the significant rise in profitability of the sector in 2001 was mainly affected by the sale of the 26% stake in the mobile operator Orange Slovakia, which was in the possession of distribution companies and SE. The companies sold their stake in the mobile operator for USD 130m. Better economic results of the electric energy sector are generally expected in future years because the deregulation of prices in 2003 will generate higher sales and profits of distribution companies. However, the economic results of SE will depend upon a couple of factors – compensation for stranded costs, privatization and the ability to compete on a single EU market.

Table 20
Results of the electric energy sector 1997 – 2001
sales, profit, value added and investments in Sk m, average monthly wages in Sk

	1997	1998	1999	2000	2001
Sales ¹	64,732	67,281	74,946	79,856	90,009
y/y sales growth (%)	-	3,9	11,4	6,6	12,7
Profit	6,028	-692	-1,992	2,410	9,277
Value added	16,775	13,845	22,879	29,032	31,042
Investments	15,776	36,751	19,794	17,006	26,946
Average monthly wages	-	-	16,515	18,591	20,838
Share of the sector in industrial production	11.2%	10.7%	11.0%	10.1%	10.0%
Share of the sector in employment	-	-	1.60%	1.58%	1.56%

Source: Statistical Office of the Slovak Republic
Note: ¹ includes sale from the production and distribution of electricity

Short-term policy measures related to the electric energy sector

What measures should companies take in the electric energy sector?

The distribution companies will not meet competition in the liberalized EU market like that of independent power producers, thanks to their status of natural monopoly. Nonetheless, they will also have to take measures to improve their financial condition to generate sufficient profits to make investments to the modernization of obsolete electric distribution system and facilities. We have identified several major areas where companies in the electric energy sector should focus to increase their competitiveness and profits - human resources, internal processes, customer relationship management, trading and outsourcing of some activities. Over-employment exists in all companies of the electric energy sector and it leads to higher labor costs. To illustrate the present excess of employees in SE, we compared the production of SE in 2002 (at that time transmission grid and a heating plant were already separated from SE) and the production of CEZ in 2001, figured in MWh per employee and month. The value of SE reached 236 MWh, while that of CES was as high as 539 MWh. However, these two figures are not fully comparable because of the different structure of installed capacities and degree of outsourcing.

Restructuring, rationalization, outsourcing and—

Since the outsourcing of some activities to external subjects can slash operating costs of companies in the electric energy sector, we consider this as a good opportunity to increase competitiveness. The outsourcing should also be accompanied by reengineering and rationalization of internal processes, i.e. the development of activities, which bring the highest added value and profit, as well as the elimination of those which generate low added value or even loss. The distribution companies and SE have already made progress in these areas but a lot should still be done to equal their EU counterparts. The distribution companies will also focus on synergies with their affiliate companies in neighboring countries. For example, the distribution system of ZSE neighbors distribution systems of Czech Jihomoravska energetika and Hungarian EDASZ, which are owned partially by E.ON Energie, minority owner of ZSE. The distribution company SSE neighbors another Czech distributor Severomoravska energetika, whose shareholders include both Electricité de France and E.ON Energie.

Case study – short-term measures that ZSE plans to take in near future

The distribution company ZSE has already commenced implementation of the restructuring plan. It is based on three major goals—simplifying management from seven to three management levels, focus on core business (outsourcing of information technologies and spinning-off construction activities) and building customer relations. The restructuring plan is based on the broad experience of German E.ON Energie with restructuring of distribution companies in emerging markets. ZSE activities will focus on three major areas: distribution of electric power, electricity trading, finance and services. Other activities will be shifted to ZSE's subsidiaries, which will specialize in the construction of a distribution network, repair of transformer stations, calibration of electrometers, etc. Significant synergies should occur after interconnection of ZSE's distribution system with those of Czech Jihomoravska energetika and Hungarian EDASZ. ZSE also strives to develop better customer-relations management and it plans to establish a customer call-center in Nitra by September 2003.

—customer relationship management should be the key to success

Another key area, which companies in the sector should focus on, is customer-relation management, marketing and trade. SE has already been striving to actively trade with electricity and develop relations with customers since 1999, but it still misses quality know-how and experience, which will come with the entry of a foreign investor. Similarly, the distribution companies have already developed their customer relations and implemented some information systems for effective registering of customers and their payments. According to a recent study by Accenture, energy companies with annual revenues above USD 2bn (SE's revenues were about USD 1.3bn) may increase their pre-tax income by USD 250m – 360m annually through the development of customer relationship management, marketing and trading. These areas, according to the study, represent the key indicator of difference between average and top energy companies. The deregulation of electricity prices, effective since the beginning of 2003, should generate sufficient sales for distribution companies to cover their costs and achieve profits. The investments of these sources into the modernization of the power distribution system could cut costs and offer better services to customers. However, the future success of SE is hard to predict at present since it will depend on a couple of factors— not only market forces but also a government decision on how to compensate for the stranded costs.

- reduction in employee numbers
- reengineering and rationalization of internal processes
- promotion of customer relationships, marketing and trade
- outsourcing of some activities to external suppliers
- development of internal information systems
- investments to modernization of generation facilities and power distribution system

Appendix

Table 21
Selected indicators of the electric energy sector in Slovakia
TWh, GWh

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total production	TWh	23.4	24.7	25.9	25.3	24.5	26.0	27.9	30.9	32.0	32.8
Gross consumption	TWh	24.5	25.2	27.3	28.9	28.6	28.3	27.8	28.2	28.3	28.6
Total losses in grid	TWh	n	n	2.1	2.0	2.1	2.0	1.8	1.8	2.3	n
Balance of foreign trade	TWh	-1.1	-0.4	-1.4	-3.6	-4.1	-2.3	0.04	2.7	3.7	4.2
Import	TWh	4.0	2.4	3.9	5.9	6.8	5.3	5.05	6.36	6.0	4.5
Export	TWh	2.9	2.8	2.5	2.3	2.7	3.1	5.09	9.03	9.7	8.7
Total installed capacity	GWh	n	n	n	6,147	6,117	6,557	6,557	6,999	8,291	n

Source: Ministry of Economy of the Slovak Republic
n – the data is not available yet