COUNTRY STUDIES

Hungary - Regulatory Reform in Electricity

1999

Introduction

The Review is one of a series of country reports carried out under the OECD's Regulatory Reform Programme, in response to the 1997 mandate by OECD Ministers. This report on regulatory reform in electricity in Hungary was principally prepared by Mr. Gudrun Lammers for the OECD.

Overview

Related Topics

BACKGROUND REPORT ON

REGULATORY REFORM IN THE ELECTRICITY INDUSTRY*

*This report was principally prepared by **Gudrun Lammers** of the International Energy Agency. It has benefited from extensive comments provided by colleagues throughout the IEA and OECD Secretariats, by the Government of Hungary, and by Member countries as part of the peer review process. This report was peer reviewed in October 1999 by the Standing Group on Long Term Co-operation of the IEA.

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1. INTRODUCTION

1. Following the collapse of the former Soviet Union (FSU) and Hungary's economic ties with the countries of the Council of Mutual Economic Assistance (CMEA) in 1989 to 1991, the country underwent a difficult period of transition from the former state-controlled economy to a market economy, during which industrial output and GDP dropped sharply and unemployment and inflation surged. Since 1996, the country has increasingly reached macro-economic stability, although the complete transformation and modernisation of its infrastructure will take significantly more time.

2. The striving for regulatory reform and the results that were obtained must be seen against this backdrop. Although the centrally-planned economy has led to inefficient resource allocation, which has left numerous traces throughout the economy, one of the most important features that the country has had to struggle with in its transition was distorted, below-cost prices. The Hungarian power industry has made significant progress in the past half decade. Distortions were removed step by step, and the industry was restructured and partially privatised, while at the same time it was brought up to western European technical standards in system operation.

3. The Hungarian electricity supply industry consists of 12 generating companies and six distribution and supply companies. The high-voltage transmission network is owned by MVM Rt., the country's state-owned incumbent monopoly power supplier. MVM also owns Hungary's nuclear power plant Paks which accounts for almost 40% of domestic power generation, as well as stakes in three fossil-fuelled power plants (Vértes, Mátra and Dunamenti). Generation is on average 50% foreign- (mainly privately-) owned; the remainder is owned by Hungarian private investors, the Hungarian Republic, MVM, municipalities, and other state-owned institutions. Distribution is on average 70% foreign-owned, in all but two cases by private investors. Much of the existing generating capacity is very old, and about 30% will need to be retrofitted with environmental control technology or replaced in the next decade, due to high air pollutant emissions and tightening environmental standards. The share of natural gas in energy consumption is twice as high in Hungary as IEA-Europe; most of this gas is imported from Russia.

4. At present, the Hungarian power market is not competitive. Generators are required to sell power to MVM under long-term contracts, and distributors are required to buy it from MVM under long-term contracts. The amount of electricity that is traded under these contracts currently amounts to some 85% of total generation. Under the current legislative framework, the main regulatory responsibility lies with the Minister of Economic Affairs who regulates end user prices. The Minister's decisions are prepared by an energy regulator (the Hungarian Energy Office, MEH) and the competition authorities. The Hungarian Energy Office controls major ownership and capital transactions. A bill aiming to introduce competition according to the provisions of the EU Electricity Directive, which would resolve some of the recommendations of this report, was approved by the Government in March 2000, and in April 2000 is under consideration by the Parliament.

1.1. Historical overview

5. The Hungarian electricity supply industry was nationalised after the Second World War. The nationalised system, which consisted of a multitude of individual entities, was combined into the government-owned Magyar Villamos Művek Tröszt (MVM T., Hungarian Electricity Board) in 1963. MVM T. had 22 subsidiary companies. Of these, 11 were power stations and a repair company, six were regional distribution companies, one was responsible for the high-voltage electricity grid (OVIT), and the remaining three were responsible for investment, construction and installation.

6. After the collapse of the Soviet Union, MVM Tröszt was corporatised. Based on proposals developed by the Ministry of Economic Affairs and submitted to the Government in April 1991, it was to be reorganised into a two-tier structure. In the upper tier, a central organisation was to be responsible for technical and economic management and overall co-ordination. This organisation was to function as a financial holding company owning and managing the second tier, the generation and network companies, which would become independent corporations. The objectives of this reform were to render transparent the economic situation of MVM T.'s individual corporate parts, to attract foreign capital for new investment, to separate ownership and operation, and to "loosen" the monopolistic structure of generation and supply. Some regulatory control over the new structure was to be given to Parliament, and to regional and local governments where combined heat and power (CHP) plants were used for district heating purposes. Regional and local governments were also attributed some small ownership stakes in power companies.

7. The proposal was accepted by the Government, and on 1 January 1992, the Hungarian power industry was split into 15 companies. MVM T. became Magyar Villamos Művek Részvénytársaság (MVM Rt., Hungarian Electricity Companies Ltd.). The companies responsible for generation and distribution/supply of electricity were formed into independent joint stock companies. MVM T. held half of the stakes in these subsidiaries. The other half was owned directly by the Government.

8. MVM's generation side was reorganised into eight different generating companies, the Vértes, Mátra, Tisza, Bakony, Budapest, Dunamenti, Paks, and Pécs power companies. Except for the Mátra, Dunamenti and Paks companies, all power companies comprise several power plants. Paks Power Co. owns and operates Hungary's 1840 MW nuclear power plant.

9. MVM owned and continues to own the Hungarian transmission grid, including the dispatching centre and the international interconnectors. Operation and construction of the transmission grid are in the hands of Országos Villamostávvezeték Részvénytársaság (OVIT Rt., National Power Line Co.), a fully-owned subsidiary of MVM. MVM is responsible for dispatch of power plants as well as the development of the whole system and security and reliability of supply.

10. Based on the supply areas of MVM's pre-existing distribution subsidiaries, distribution and retailing was organised into six different companies with exclusive supply areas: Édász,[1] Elmű Rt.,[2] Émász Rt.,[3] Titász Rt.,[4] Démász Rt.,[5] Dédász Rt.[6] All of the companies created in the restructuring effort of the first half of the 1990 still exist and operate today.

11. In January 1992, all distributors, all power generation companies, and OVIT were 50% owned by MVM. The remainder was owned by the Hungarian State, except for small ownership stakes held by municipalities. These ranged between 1% for generators, 2.46% for distributors, and 7% for OVIT. MVM in turn was 99.82% owned by the Hungarian State and 0.18% by municipalities. This situation remained unchanged until 1995, except for a limited share swap between the owners of the power plant companies and the Hungarian Coal Mining Restructuring Centre, following the combination of power plant companies and coal mines in 1993.[7]

12. In December 1994, it was decided that all generating companies except Paks and all six distribution and supply companies should be privatised by early 1997. MVM was to retain the Paks plant and the grid company OVIT. MVM would also continue to be responsible for import and export of electricity, wholesale trading, reliable power supply, system development and investment in generation, and the operation and development of the transmission grid.

13. A first round of asset sales occurred in late 1995. Following various delays in the privatisation process, in many cases due to bids deemed unsatisfactory by the Government, stakes in all distribution and

supply companies and all generating companies except Paks (Paksi Atomerőmű Rt.) and Vértes (Vértesi Erőmű Rt.) were sold by early 1998. At end-1998, participation by foreign investors stood at 75% of total share capital in power retailing. The corresponding figure for power generation was 50%, with 50% still owned by MVM. However, six power plants are majority foreign-owned today. According to the draft energy programme of the government in office since Spring 1998, MVM and Paks are to remain in state ownership until after Hungary's EU Accession in 2002 or 2003. MVM is the most significant asset remaining in government ownership today.

14. The 1994 Electricity Act (Act XLVIII of 6 April 1994 on the Production, Transport and Supply of Electric Energy) is the most important part of the legal foundations of the present functioning of the Hungarian electricity supply industry. This Act, which came into force in 1995, provides a general framework for the operation and regulation of the Hungarian power industry. Notably, it describes the tasks and responsibilities of the Minister of Economic Affairs and of the Hungarian Energy Office (Magyar Energia Hivatal, MEH) in price regulation and control of new investment.[8]

15. In late 1998, the Government began procedures to adapt the legislation governing the Hungarian electricity supply industry to the EU Electricity Directive. Hungary aspires to join the EU by 1 January 2002, and it is the Government's plan to establish the EU-conforming electricity market by 1 January 2001. For this reason, it strives to have the new Draft 1999 Electricity Bill adopted by the end of 1999 or in early 2000. This Bill will replace the 1994 Electricity Act, which expires in July 2000. The Bill is described in detail in Section 3.4, The Introduction of Competition.

1.2. Generation

16. The Hungarian electricity supply industry comprises 45 power plants for public electricity supply, amounting to 7 352 MW of capacity in 1997. In addition, there are 182 MW of industrial autoproduction; these comprise two power plants owned by foreign investors, the Csepel plant (owned by PowerGen) and the Dunaújváros (owned by EMA Power). Table 1 shows the eight largest power generating companies in Hungary and the power plants they own.

Table 1. **The eight largest power generating companies in Hungary in 1997**

Licensed generators and their power plants

Company	**Fuel type**	**Capacity MW**	**Share of total public supply capacity (7 352 MW) in %**
Dunamenti	Oil & gas	**2 121**	**29**
Paks	Nuclear	**1 840**	**25**
Tisza		**1 281**	**17**
Borsod	Brown coal	171	
Tiszapalkonya	Brown coal	250	
Tisza II	Oil & gas	860	
Mátra	Lignite	**800**	**11**
Vértes		**367.2**	**5**
Bánhida	Brown coal	100	
Oroszlány	Brown coal	235	
Tatabánya	Brown coal	32.2	
Bakony		**354**	**5**

Ajka	Brown coal	132	
Inota	Brown coal	52	
Inota gas turbine*	Gas turbine	170	
Budapest		**294.2**	**4**
Kelenföld	Oil & gas	229	
Kőbánya	Oil & gas	21.9	
Újpest	Oil & gas	9.6	
Angyalföld	Oil & gas	9.7	
Kispest	Oil & gas	24	
Pécs	Hard coal	**190**	**3**
Total		**7 247.4**	**99**

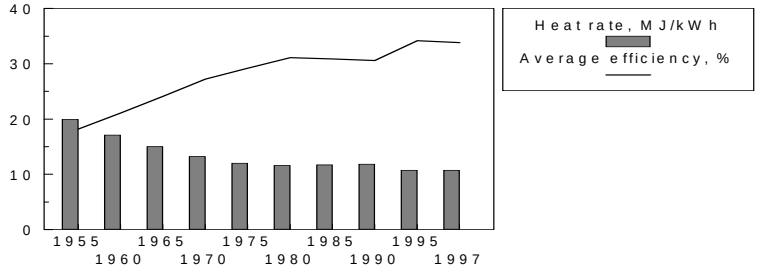
* = in MVM Rt. ownership (only operation).
Source: MVM.

17. The electricity system is to a large degree old and obsolete: the average age of power plants is 21 years; coal-fired plants are even older, 28 years on average. The size of the power plants, their age and geographical location, and the fuel they are using reflect the pattern of past investment in generating capacity which occurred in distinctive waves in Hungary.

18. Plants burning brown coal were mostly commissioned in the 1950s and 1960s, although some date back to the 1930s and 1940s. They are generally very small and located near the coal mines. Their thermal efficiency is very low. Figure 1 shows the average thermal efficiency (η) of the Hungarian power supply system between 1951 and 1997.

Figure 1. **Average thermal efficiency in Hungary's power system**

Public supply, in %



Source: MVM.

19. The next wave coincided with the development of Hungary's lignite deposits, situated in the north-east of the country. The fuel was used in the Mátra (formerly Gagarín) power plant which has generating units of 100 and 200 MW. Around the same time, larger "hydrocarbon" (oil and gas dual-fired) boiler plants were built, *e.g.* the Dunamenti and Tisza II plants, equally with larger block sizes of above 200 MW.

20. Hungary's nuclear power station at Paks was commissioned in 1981 to 1987 and consists of four double blocks of 2 * 230 MW each, yielding 1 840 MW total capacity. The reactors are of the Soviet

VVER-440 design. Originally, there were plans to build two more nuclear units of 1 000 MW each at Paks in the early 1990s, but the plans did not materialise due to the political events in the early 1990s. Table 2 shows the size distribution of power plants in Hungary.[9]

Table 2. **Size distribution of generating units in Hungary**

All input fuels, public supply

	< 20 MW	20-49 MW	50-99 MW	100-200 MW	> 200 MW
Number of units	41	16	12	12	18
In number of power plants*	8	7	4	5	3
Capacity (MW)	334	451	740	1 787	3 990

* Note that this table does not list very small power plants below a capacity of 3 MW.
Source: IEA estimate based on MVM statistics.

21. As illustrated by Table 3, installed capacity has remained stable in recent years. Some 22% of this capacity is used as reserve capacity, which explains the difference between installed and useable capacity in the table. These are mainly older units with low thermal efficiency and/or high pollution levels.

Table 3. **Capacity and load in the Hungarian electricity supply industry**

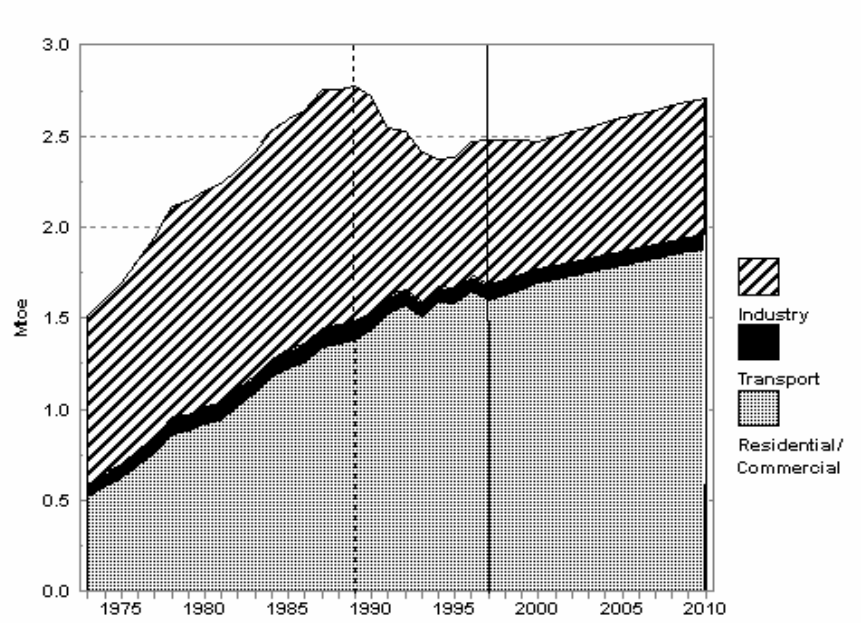
GW

	1980	**1985**	**1990**	**1995**	**1996**	**1997**	**1998**
Installed Capacity	5.4	6.2	7.2	7.3	7.5	7.5	7.6
Useable Capacity	4.2	4.9	5.4	5.6	6.0	6.0	6.3
Import Balance	1.3	1.7	1.8	0.4	0.4	0.4	0.1
Peak Load	5.1	6.1	6.5	5.7	5.8	5.7	5.8

Source: Hungarian Energy Office (MEH).

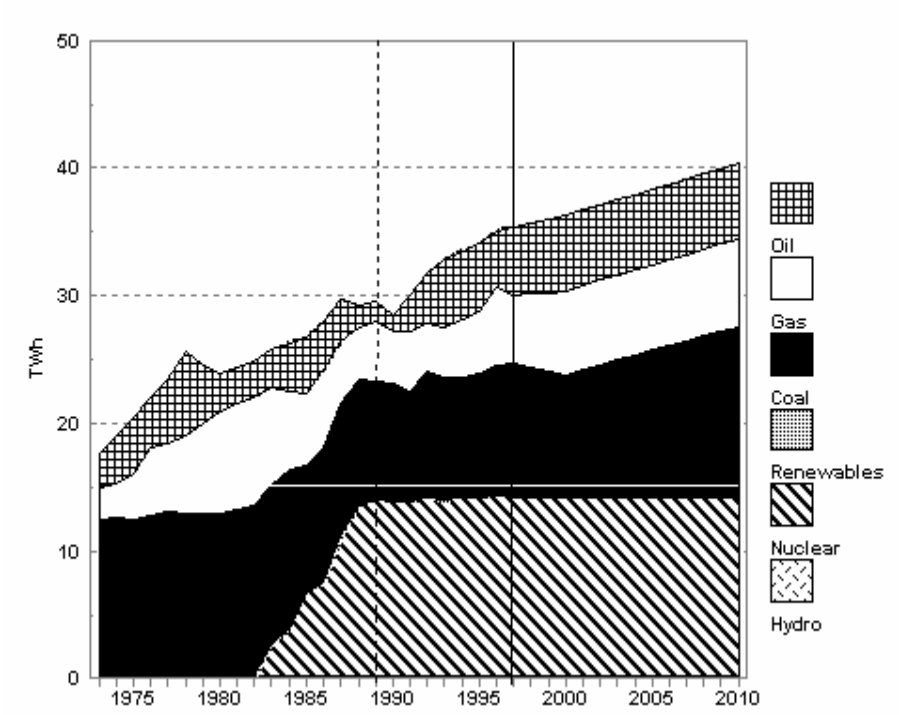
22. Electricity demand, which had stood at a maximum of 40.7 TWh in 1989, collapsed after 1990 as a consequence of the breakdown of the centrally-planned economy. Although it started growing again in 1995, consumption had not yet reached its 1989 level again in 1997: gross consumption amounted to 35.6 TWh, 13% less than in 1989. Despite these rather drastic demand swings, net domestic generation continued its growth trend almost unbroken, and rose from 27.0 TWh in 1989 to 32.4 TWh in 1997. This is due to the fact that imports from the Soviet Union (Ukraine) fell to about 10% of their previous amount during the same time and had to be replaced by domestic generation to a large degree.[10] Total imports now stand at about 20% of their values in 1990. Figures 3 and 4 illustrate the development of power demand and supply over the last decades.

Figure 2. **Electricity demand by consuming sector, 1973 to 2005**



Source: IEA/OECD (1998), *Energy Balances of OECD Countries*, Paris; and country submission.

Figure 3. **Electricity generation by fuel, 1973 to 2010**



Source: IEA/OECD (1998), *Energy Balances of OECD Countries*, Paris; and country submission.

23. Figure 2 highlights the collapse of industrial electricity demand after 1990. Residential and commercial demand continued its growth unabated; electricity demand for transport showed no significant growth.

24. Figure 3 shows electricity generated by input fuel. The growing importance of the Paks nuclear plant is clearly discernible. It accounted for some 39.5% or 13.97 TWh of generation in 1997. The second most important fuel was coal, with 26.5% or 9.73 TWh. Oil and gas were at a par with 16.6% (9.59 TWh) each. Renewables played a very minor role: hydro generation, almost all run-of-the-river, accounted for 0.6% (0.179 TWh) and combustible renewables accounted for only 0.3% (0.3 TWh).

25. The Paks plant is the among the cheapest producers in Hungary. Together with the two lowest-cost conventional power plants, Mátra and Dunamenti, it was the only plant to make profits during the slump in demand in the early 1990s. As usual for nuclear power plants, Paks has the lowest running costs but its total average costs are somewhat higher than those of Mátra and Dunamenti.

1.3. Future investment needs

26. Electricity demand in Hungary collapsed during the transition to the market economy and will not recover to pre-transition levels before 2010, despite the fact that demand started growing again in 1995. For this reason, Hungary has more than enough generating capacity to cover demand, and demand growth does not require investment. However, under the command economy, regular reinvestment and technical upgrading did not occur. This is the cause for the low thermal efficiency and very old age of a large part of domestic capacity, which was illustrated in the previous chapter.

27. Some of the old units would have reached the end of their economic, or even technical, life in a market economy long ago, and would have been replaced by new plant. This is the case of the 22% of installed capacity that is not included in the available capacity in Hungary. There are other units which might be economic to operate, despite the low efficiency, given that in many cases they do not carry high, or any, capacity cost. However, they are not operated or due for decommissioning and replacement in the near future because of their high environmental emissions. In the centrally-planned economy, environmental protection measures were scarce, and lax environmental standards allowed the use of low-quality fuels, mainly coal and heating oil.

28. After the transition, environmental regulations were tightened considerably. As a consequence, a large number of power plants fail to comply with present environmental standards, and the environmental emissions of most power plants exceeds permitted levels, resulting in heavy environmental fines each year. These fines are paid by the generating companies; in 1997, a total of 347 million Forints (roughly 2 million US$) was collected from generators in Hungary. Moreover, environmental standards are continually tightened: environmental legislation enacted in 1995 was replaced with more stringent environmental standards in 1997. Existing power plants were granted an 8-year moratorium with respect to these standards, but subsequently each non-complying power plant will be closed down. In almost all cases, retrofitting of environmental technology is uneconomic for the old coal-fired power plants; the cheapest solution is construction of new power plant blocks at the existing sites.

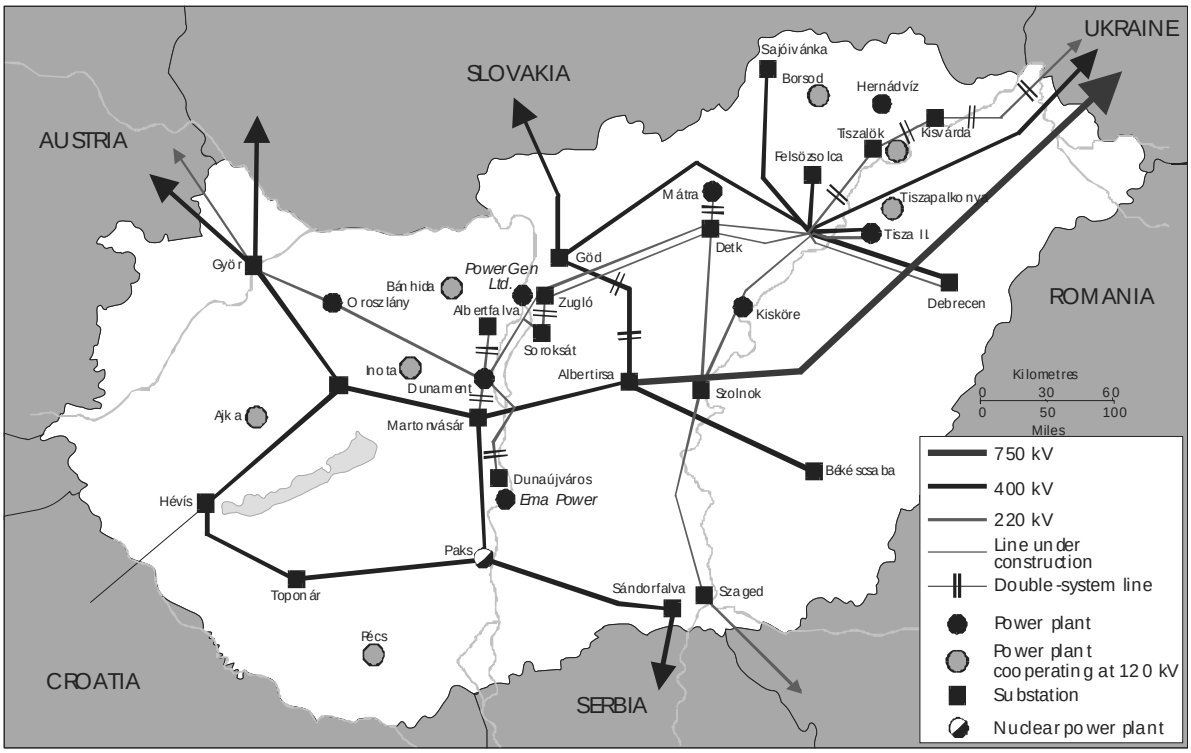
29. As a result of tightened environmental standards, the existing total power plant capacity of nearly 7 500 MW is likely to be reduced by some 2 200 MW through the elimination of the obsolete coal-fired power plants by the year 2010. By 2000, some 500 to 700 MW will be removed from the system, which means that the process will accelerate between 2000 and 2004. In addition to this, some new capacity will be needed to fulfil the conditions required for UCPTE interconnection and cover the demand growth that

will occur. The Government and MVM estimate that a total of about 3 800 MW of new capacity will be needed over the next 15 years.

1.4. Transmission, interconnection and international trade

30. The Hungarian transmission system also underwent dramatic changes during the last nine years. Figure 4 shows the current state of the transmission system and the main power plants connected to it.

Figure 4. **The Hungarian transmission network and main power plants**



Source: MVM.

31. The map shows one high voltage alternating current (AC) power line of 750 kV and about 2 000 MW capacity, entering Hungary from Ukraine and ending at the Albertirsa substation. Long-distance transport of electricity over this type of transmission lines is economic only for very large amounts of electricity, and it is used only in a few exceptional cases elsewhere in the IEA.[11] It is typical of the trade relationships prevailing in the former UPS/IPS (United Power System/Integrated Power System) which connected the Former Soviet Union and its neighbouring states within the framework of the Council of Mutual Economic Assistance (CMEA). This power line, which came into service in the late 1970s, is part of a whole 750 kV network that linked Hungary, Poland and Bulgaria to the large-scale power plants of the Former Soviet Union, including the Chernobyl power plant in Ukraine.[12] Hungary had contributed financially to the construction of this line and some of the power stations it connects. There are two other power lines, one 400 kV line and one 220 kV line along a parallel corridor, terminating at the Sajószöged substation in eastern Hungary.

32. The total import capacity of these lines was 4 000 MW, amounting to about twice the capacity of the biggest Hungarian power plant, the Dunamenti plant, and over 60% of peak load in 1990. At the apex

of electricity imports in the same year, 12.2 TWh of electricity were imported (net imports) from the Soviet Union (Ukraine) over these lines, amounting to exactly one third of gross electricity consumption in Hungary. In comparison, electricity imports account for less than 10% of electricity consumption in IEA Europe, and less than 2% in IEA North America. The net imports of Italy, the largest electricity importer in the IEA, amounted to only 13% of its power consumption in 1997.

33. In addition to power trade with the Soviet Union, Hungary also traded comparatively small amounts of electricity with Czechoslovakia, Romania, Yugoslavia and Austria. It was a net importer only with respect to Austria, and to a very minor extent (17 GWh in 1990).

34. These imports from the Soviet Union occurred under long-term contracts which were originally to expire in 2004. After 1990, and most markedly in 1992, imports from the Soviet Union were reduced due to increasingly unattractive prices and unfavourable terms as well as due to unreliable supply. One year later, Ukraine suspended all exports to Hungary due to domestic shortages. Shortly afterwards, the Ukrainian power system was isolated from the UPS/IPS system. As a consequence, Hungarian annual imports from Ukraine fell further and today stand at 1.37 TWh (net imports). As imports from the east were reduced, Hungary increasingly imported electricity from Slovakia, part of which originates in Polish power plants.

35. Since the beginning of the 1990s, Hungary sought to leave the UPS/IPS power system and connect itself to the Western European UCPTE (Union for the co-operation of electrical energy production and transmission) system. Poland, the Czech Republic and Slovakia had the same objective, and together these countries founded CENTREL, the Association for the co-ordination of Polish, Czech, Slovak and Hungarian electric power companies. The objective of CENTREL was to improve their power systems quickly to reach the much more exacting UCPTE standards, to synchronise[13] their networks with them, and to become members of UCPTE as soon as possible.

36. Synchronisation with the UCPTE meant first and foremost disconnecting the CENTREL system from the UPS/IPS system. The CENTREL countries achieved this in 1993; following this, their possibilities to trade with electricity suppliers outside of CENTREL was strongly reduced. Trade could still take place across direct current (DC) lines and the appropriate converter stations; Hungary's trade with Austria could continue over the DC line connecting Győr and Vienna and the respective converter station in the south of Vienna which came into service in December 1992. Since 1995, the Vienna converter station is out of use since it was by-passed by an AC power line. Another possibility for imports was to import from power plants which were isolated from their own system and synchronised with the CENTREL system. This is the method that allowed, and still allows, continued - though greatly reduced - imports from Ukraine although the Ukrainian system and the CENTREL system are not synchronised any more since 1993.

37. Subsequently, Hungary had to improve certain aspects of its power system. AC interconnection requires the systems of member utilities to be "in phase". This means that the flow direction of electrons in the wires must change synchronously. In Europe, the frequency of these oscillations is 50 cycles/second or 50 Hertz (Hz). The UCPTE system requires frequency control in a narrow band of ± 0.1 Hz; greater frequency variations can cause problems ranging from breakdown of computer systems to brownouts and blackouts in large areas of the system. Compliance with these technical requirements generally means that additional power plant capacity has to be put in place. This capacity delivers so-called ancillary services, *e.g.* it generates only to maintain frequency or voltage at the required levels, and therefore has to be capable of starting generation very quickly. For Hungary, this meant that the objective was to be able to increase power generation by 8-10 MW per minute per unit, whereas its best performance was 5 MW per minute and per unit. In response to these requirements, two gas turbines were installed in Sajószöged and

Litér – Hungary does not have mountainous areas suitable for hydro plants with storage capacity. MVM is at present building another gas turbines as secondary reserve in Lőrinci.

38. After several encouraging test runs, the CENTREL and UCPTE systems were synchronised in October 1995 and continue to run in parallel. Utilities from the CENTREL countries are associated members of UCPTE, but their objective is to become full legal members in the near future. Figure 5 shows Hungary's and CENTREL's interconnections at the end of 1997. The converter station to the south of Vienna is out of operation.

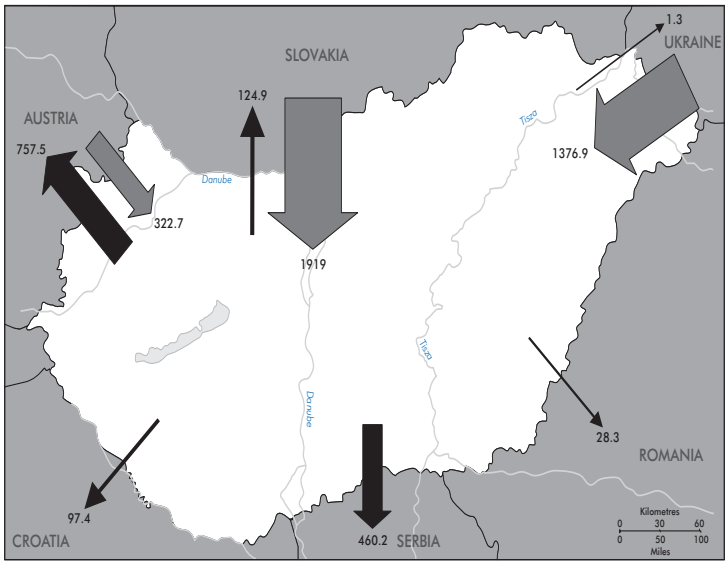
Figure 5. **Hungary's international interconnections**

Source: MVM.

39. In 1997, net annual imports from Slovakia stood at 1.79 TWh. Power exchanges with Austria are balanced in the long term. Total net imports were drastically reduced: in 1998, they amounted to 0.74 TWh per annum, representing lees than 1/5 of their amount on 1990 and less than 6% of total gross consumption in 1997, which is approximately the share of net trade in the UCPTE and compares very favourably with trade in North America. Until 1997, the Minister of Economic Affairs retained the powers, attributed to

him under the 1994 Electricity Act as a precautionary measure against renewed import dependency, to control the amount of electricity imports and exports. Since 1997, the Hungarian Energy Office is responsible for import control. In 1998, imports amounted to only 1.6% of total gross electricity consumption, far below the set limit. Figure 6 shows the gross trade flows in 1997.

Figure 6. **Hungary's transboundary electricity trade**



Source: MVM.

40. Aside from the 750 kV line, the Hungarian transmission network consists of a 400 kV network, begun in 1967, which connects most of the large power plants. Some power plants such as one block of the Dunamenti plant feed into a 220 kV network, built up as of 1960 but not added to since 1970. Some power plants, including Pécs and Borsod, are connected to the 120 kV network. This network is almost twice as long as the 400 and 220 kV grid, but most of it is used as distribution lines and was transferred from MVM to the distributors in 1992. MVM continues to operate the parts that are linked to power plants and function as low-voltage transmission lines.

41. This grid layout reflects the gradual development of the generation and distribution system and Hungary's past as a country largely depending on electricity imports whose main concern was to distribute the imported electricity. It is not adapted to present and future requirements, which are likely to involve smaller amounts exchanged over shorter distances. In addition, large parts of the grid, especially the 220 kV grid, are old and in need of overhaul. There are to date no plans to upgrade the 400 kV and 220 kV transmission system, which has less capacity than the interconnectors.

1.5. Distribution and supply

42. There is no competition in electricity supply in Hungary at present. Therefore, the distribution and retailing companies are required to buy the nearly all of their power, 95-97% in practice, from MVM. Some of the distributors own small CHP plants, and all of them could apply for licenses to build further capacity. But this would not be cost effective, since the existing plants have low depreciation charges and can offer cheap electricity, while new plants would have to meet expensive environmental standards and would not cover their production costs.

43. The distributors operate under an obligation to supply and serve just over five million customers. This includes over 4.5 million households, representing an increase of one million since 1980. They are also responsible, on the basis of the contracts signed with the local municipalities, for street lighting.

44. When the six distribution and supply companies were corporatised in 1992, all but a small remainder of the 120 kV network was transferred into their ownership. Beforehand, most of the 120 kV network had been owned and operated by MVM's subsidiaries (OVIT). Hungary is fully electrified. Only 0.7% of homes and holiday houses are not connected to the public grid. Table 4 shows company indicators related to the six distribution and supply companies.

Table 4. **Hungary's regional distribution and supply companies**

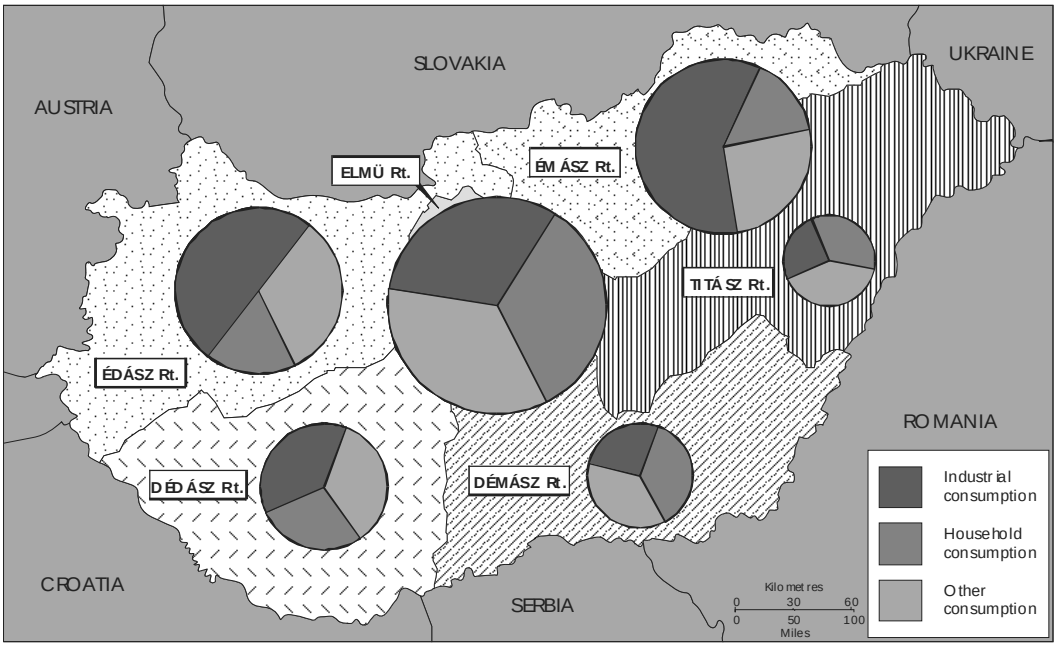
Company	Region Served	Supply Area km^2	Number of Customers
ELMÜ	Budapest & surroundings	4 050	1 317 000
ÉDÁSZ	North west	18 230	882 582
DÉDÁSZ	South west	18 414	675 500
ÉMÁSZ	North east	15 501	695 100
DÉMÁSZ	South east	18 235	730 000
TITÁSZ	East	18 728	700 000

Source: Company data, HSBC JC estimates.

45. Figure 7 shows the sectoral shares of power consumption in the regions in 1997. It illustrates the high share of industrial electricity demand in the north-east and north-west of Hungary and its comparatively low share in the south.

Figure 7. **Sectoral shares of electricity consumption in the supply regions**

1997

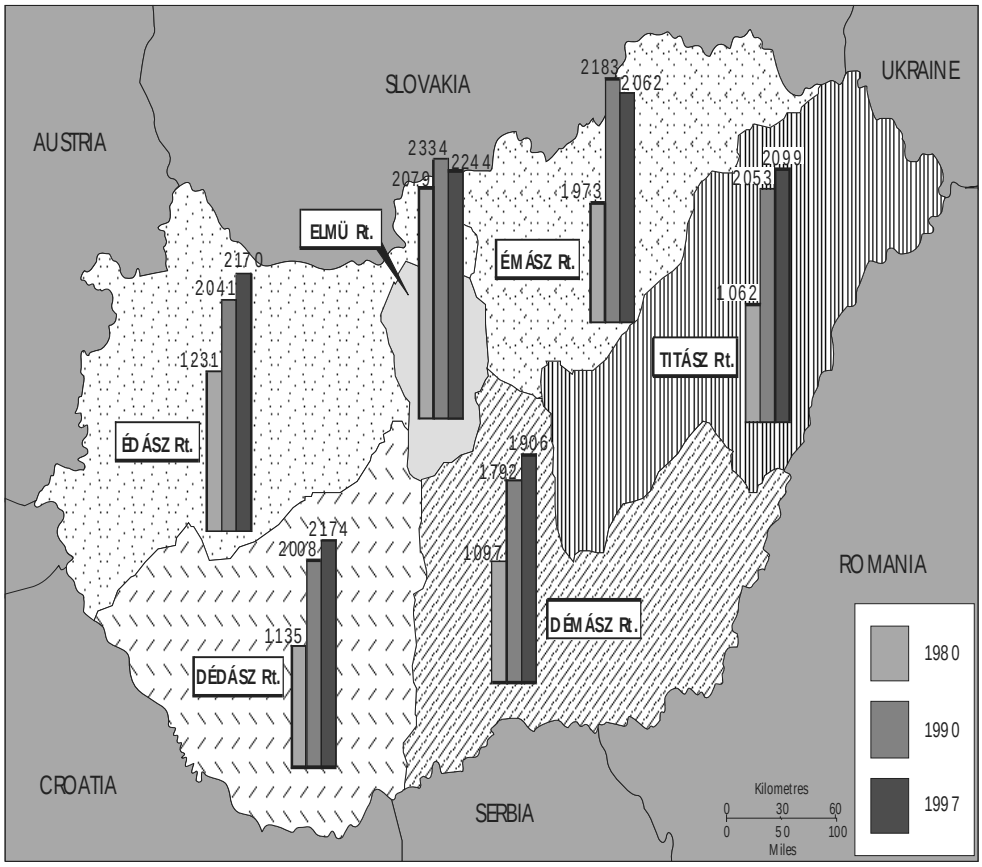


Source: MVM.

46. Figure 8 shows the development of electricity consumption per inhabitant in the six supply regions between 1980 and 1997. It illustrates to what degree power consumption in the regions has caught up with power demand in Budapest over the last 17 years. This happened in a somewhat peculiar way. The share of electricity consumption metered according to time of day (night and day) is the higher, the smaller the town or village is. Whereas only 11.3% of electricity consumption was metered with a day-night meter in Budapest, the share for towns was 30.9% and the share for villages was 43%. These figures relate to 1997 but they confirm a long established trend. The reason for this is that electricity used to be more expensive in remote villages than in Budapest or major cities, and making use of day-night tariffs enabled customers to make use of cheaper rates.

Figure 8. **Electricity consumption per inhabitant in the supply regions**

1980, 1990 and 1997



Source: MVM.

2. REGULATORY REFORM IN THE HUNGARIAN ELECTRICITY SUPPLY INDUSTRY

2.1. The current functional model of the Hungarian power industry: the IPP approach

2.1.1. Restructuring and privatisation

47. The modifications in ownership and structure that the Hungarian power industry has undergone since the beginning of the 1990s are extraordinarily complicated and cannot be compared directly with the relatively orderly transition that even the most drastic restructuring in other OECD countries involved. Hungary was not only faced with the task of breaking up an incumbent monopoly power company but with adapting its whole economy to the rules of the market – and with the task of learning what this involved as the country went through the process.

48. The future structure of the business was not neatly set out before the actual share transfers were carried out. Subsequent Governments had conflicting objectives regarding restructuring, privatisation and competition, which meant that at times the process came to a halt or was even partly reversed. The institutions that are necessary for privatisation and for the functioning of the market were either missing or new and inexperienced, and often had conflicting ideas about the way ahead among themselves.

49. Hungary's foreign debt created large pressure on the Government to raise revenue as quickly as possible. The debt incurred by most companies in the industry towards the end of the command-and-control economy, their need for finance, and the lack of finance capital in the Hungarian domestic capital market meant that sale to foreign investors was the only practicable way[14] of restructuring the power industry and ending up with a functioning market while carrying out the necessary modernisation as quickly as possible. High unemployment led to demands to find ways of preserving employment, especially in coal mining, even at the cost of continuing inefficiencies. All these factors created a large amount of insecurity surrounding the Governments' approach towards the power sector, high regulatory risk, and, as a consequence, low bids by foreign investors in the first privatisation rounds. In response, the Government deferred or abandoned the sale in several cases.

50. The structure of the Hungarian power industry as it stands in 2000 is a result of this somewhat chaotic process. This section attempts to trace back the intertwined changes in the ownership and structure of the Hungarian power industry between the starting point, 1992, and the end point, 1998, which were both described briefly in Section 1.1. Table 6*a* at the end of this section provides an overview.

51. In early 1992, nearly all shares of MVM (99.82%) were held by ÁVÜ, the Hungarian State Property Agency, which was responsible for managing state-owned assets in the early 1990s. MVM held 50% of the shares in the distribution companies and the grid company OVIT. The remainder was, in turn, owned by ÁVÜ; some small stakes in the distributors and in OVIT were also owned by municipalities.

52. Also in 1992, the Government created a state privatisation agency, ÁV Rt. (State Asset Management Company). In the month of August of the same year, the shares of MVM were transferred from ÁVÜ to ÁV Rt., but ÁVÜ kept its shares in the subsidiary companies. In 1993, ÁVÜ proceeded to sell its stakes in the regional distributors, 46%-48%, depending on the individual company. ÁVÜ issued a call for tender for 15% stakes in these companies in September 1993. This sale was opposed by ÁV Rt. on the grounds that the conditions for realising the full value of the companies were not given – the Government estimated that the bids amounted to only 25-35% of the companies' value. This was attributed to high regulatory risk, due to the fact that no decision had as yet been taken regarding the future structure of the power industry, its regulation, or its mode of operation. As a result of these altercations, the shares held by ÁVÜ were transferred to ÁV Rt.

53. 1993 saw the beginning of a development that added an additional layer of complication to the privatisation and restructuring process. In order to facilitate the economic survival and privatisation of some of the Hungarian coal mines, the Government decided to combine collieries and nearby power stations capable of taking their production. Thus, Mátra Power Co. was combined with the Visonta and Bükkábrány open cast lignite mines, Bakony Power Co. with the Padrag, Ármin, Jókai and Balinka (1994)

coal mines, and Pécs Power Co. with the Külfejtés and Komló mines. All three mines were considered economically viable.

54. These transactions were carried out as share swaps: SZÉSZEK, the Hungarian Coal Mining Restructuring Centre, transferred the coal mining assets to the generating companies owning the power plants, and received shares in the integrated companies in exchange. SZÉSZEK received about one quarter of the shares of the integrated companies, about half of this out of MVM's shareholding in the firms, and the other half directly from ÁV Rt. The process continued throughout the following years. In 1994/95, Vértes Power Co. was integrated with the Oroszlány and Mány mines, and Tisza Power Co.'s Borsod coal plant with the Lyukóbánya mine. According to the privatisation agreements, the integrated coal mines will continue supplying the power plants until the plants are shut down.

55. In 1995, ÁVÜ, ÁV Rt. and the Treasury Property Management Organisation (KVSZ), another Government asset management agency, were merged into one organisation called ÁPV Rt. (Állami Privatizációs és Vagyonkezelő Rt., State Privatisation and Holding Company). This organisation is responsible for carrying out privatisations and managing residual state ownership. ÁPV Rt. became the new state shareholder in MVM and the second tier of the electricity supply industry, based on the Privatisation Act of 1995 (Act XXXIX of 1995 on the Sale of Entrepreneurial Property Owned by the State).

56. In December 1994 the Government decided to sell 50% plus one share of the six distribution and supply companies to strategic - preferably foreign - investors. Another 15% were to be given to small domestic investors and institutional investors. The regional distribution companies were to be fully listed on the stock exchange by 1 January 1997.

57. Except for the Paks nuclear plant, the same privatisation strategy was to be applied to the eight generating companies. Here also, 50% plus one share were to be sold to strategic investors. Remaining shares were to be offered to domestic and institutional investors, and the generators were also to be fully listed on the stock exchange at the beginning of 1997. The Government in office in 1994/95 had plans to sell a minority stake in MVM, including Paks and OVIT, and the Privatisation Act of 1995 explicitly allows partial privatisation of MVM. Since the Government does not hold a golden share[15] in MVM, the Privatisation Act requires it to maintain a 50% plus one vote majority shareholding. At the end of 1995, ÁPV Rt. invited bids for companies within the electricity (and gas) market. The share offering amounted to:

- 47-49% of the six distributors, with an option to buy more up to a ceiling of 50% + 1 until end 1997;
- 38-49% of four generators; and
- 24% of MVM.

58. Only so-called "trade investors" were allowed to bid, *i.e.* investors were required to have experience of similar businesses abroad. The number of companies a single investor could acquire was limited, and investors' business plans had to include employment guarantees. The government in turn guaranteed to raise electricity prices sufficiently to ensure an 8% rate of return on investment in all partially privatised power companies for the first years, provided the companies were operated efficiently.

59. Bids were received for all companies except two power companies combined with underground brown coal mines. They were accepted for all six distribution companies and two power stations. One bid

was received for the stake in MVM, from a consortium consisting of Bayernwerk, EdF and Aare-Tessin of Switzerland, but was rejected.

60. The initial bidding was dominated by French and German companies, while bids put in by US and UK companies tended to be conditional, and therefore less acceptable to ÁPV Rt. UK and US bidders, including Southern Electric, PowerGen, National Power and Eastern Electricity, felt that the pricing environment and regulatory conditions were not clear enough, and Midland Electricity pulled out of the tendering process on grounds that there was insufficient information to evaluate risk.

61. By the end of 1996, the offered stakes in all of the six distribution and supply companies were sold for between 30% and 80% of the book value of these companies. In the shareholder agreements, the foreign investors were given full management rights even though their stakes amount to 49% at most. By mid-1998, most investors had purchased further stakes (see table 5*b* below). The Government, through ÁPV Rt., retains a golden[16] share in all of them, which, among other things, gives it control over mergers and acquisitions. It should be noted that some of the new owners of Hungarian generating capacity are themselves majority or even fully state-owned, *e.g.* EdF or IVO of Finland.

62. In contrast, only two of the eight generators created in 1992 (Mátrai Erőmű Rt. and Dunamenti Erőmű Rt.) were sold in 1995, and doubt remains as whether their sale raised book value, although ÁPV Rt. maintains they did. Another tendering round for generating companies was organised in Autumn 1996. In the 1995 round, the government had guaranteed to set prices in such a way that efficient generators could earn an 8% rate of return. This commitment was reiterated when two further power plants, (Tiszai Erőmű Rt. and Budapesti Erőmű Rt.), were sold to AES and to IVO/Tomen in 1996 and 1997, respectively, and a price increase was promised for October 1996. However, the Government failed to raise prices in October 1996, and building frustration over the definition of the cost elements contained in the rate base upon which the 8% return would be measured seemed to vindicate those bidders who had complained about lack of detail and an uncertain operating environment.

63. In December 1996, Tractebel was reported to be considering legal action to recover its investment costs is the Dunamenti plant, while AES Electric, which had bought the Tisza power plant, also expressed its dissatisfaction. However, most foreign investors emphasised their position as long term investors in Hungary's economic growth, and despite these problems, Pécsi Erőmű Rt. and Bakonyi Erőmű Rt. were privatised in 1997. In return, MVM has recently criticised Tractebel and AES for delays in their refurbishment plans for Dunamenti and Tisza.

64. The vertical integration of coal mines with power plant companies also created delays in the privatisation process, because investors were reluctant to invest in these plants and submitted bids that were not acceptable to ÁPV Rt.[17] Eventually, the attempts to auction off those three integrated plants that had not yet been sold failed. Two of them, Pécs and Bakony, were nevertheless partially privatised – the privatisation agreements were eventually signed on 23 December 1997 – but it took protracted direct negotiations to do so. The Vértes plant is still not sold because no suitable sales agreement could be concluded. Together with the Paks nuclear plant, it is the only regular generating plant remaining in MVM's ownership. In addition, three reserve plants are being built by MVM as part of UCPTE requirements. However, the intention persists to sell the Vértes plant.

65. In the privatisation process, some power plants were spun off from the eight power generators created in 1992. This was the case for the Borsod plant (Borsodi Energetikai Kft.), which used to be part of Tisza Power Co. The Borsod coal-fired power plant uses coal from the Lyukóbánya mine. It was sold separately from its mother company, although to the same foreign investor, AES. This enabled AES to buy a stake of 95.77% in Tisza but only 67.92% in the Borsod plant. The 171 MW Borsod plant consists of nine individual boilers of 4 MW to 30 MW nameplate capacity. Tisza Power Co. has two other plants, an

860 MW oil and gas-fired plant consisting of four individual units of 215 MW each (Tisza II) and an old coal-fired plant (Tiszapalkonya).

66. Some power plans previously operated by industrial auto-producers were sold to foreign investors and now supply the Hungarian power market. This is the case for the Csepeli and Dunaferr power plants. Csepeli Power Plant Company (Csepeli Erőmű Rt.) near Budapest, had been used for autogeneration by the now-defunct industrial company Csepel Industry Works Co. Since 1995, it is fully owned by PowerGen. The Hungarian Energy Office has recently approved plans to replace the existing plant with gas-fired technology. Today, there is a total of 12 licensed electricity generating companies, including the two hydro-electric generators Hernádvíz Hydro Power Ltd. (one plant) and Tiszavíz Hydro Power Ltd. (two plants). Tables 5a and 5b show the participation of foreign investors in the Hungarian electricity supply industry in 1997, *i.e.* before the sales agreements regarding Pécs and Bakony were concluded. Table 6 provides a complete overview of the ownership situation in the Hungarian power industry at end-1998.

Table 5*a*. **Ownership and market share in electricity generation**

June 1998

Generators	**Owners**			**Total capacity (MW)**	**Share of total generation, %**
	Company	**Country**	**% Share**		
Dunamenti	MVM Tractebel	 Belgium	25.1 73.75	2121	n.a.
Paks	MVM		99.92	1840	40%
Tisza	AES	US	95.77	1281	n.a.
Borsod Power Plant	AES AES-Tisza	US	32.09 67.92	171	n.a.
Mátra	MVM RWE EnBW Rheinbraun	 Germany Germany Germany	25.5 28.57 21.43 21.43	800	n.a.
Vértes	MVM		42.9	367.2	n.a.
Bakony	n.a.			354	n.a.
Budapest	IVO / Tomen	Finland/Japan	87.68	294.2	n.a.
EMA-Power	Tenneco Dunaferr (Epic Energy)	US	50 50	n.a.	n.a.
Csepel1 [1]	PowerGen	UK	100	n.a.	n.a.

[1] Csepeli had previously not been part of MVM but an industrial autoproduction facility, and was sold in a separate privatisation process.

Source: Hungarian Energy Office, Ministry of Trade and Industry.

Table 5*b*. **Ownership and market share in electricity supply**

June 1998

Distributors/ Retailers	**Owners**			**% Share of Total Sales**
	Company	**Country**	**Share in %**	
ELMÜ	RWE EnBW	Germany Germany	50.62 25	27.04

ÉDÁSZ	EdF	France	27.39	21.57
	Bayernwerk	Germany	23.77	
ÉMÁSZ	RWE	Germany	50	16.24
	EnBW	Germany	21.43	
DÉDÁSZ	Bayernwerk	Germany	75	12.29
TITÁSZ	Isar Amperwerke	Germany	74.99	11.47
DÉMÁSZ	EdF	France	50	11.39

Source: Hungarian Energy Office, Ministry of Trade and Industry.

Table 6. **Ownership in the Hungarian electricity supply industry**

Percent, December 1998

Owner	**Generation**	**Transmission**	**Supply**	**Industry total**
Republic of Hungary	7.2	99.8	5.0	43.0
Municipalities	0.7	0.2	4.4	2.0
Hungarian Investors	61.5	0.0	13.4	11.9
Total Hungarian	**69.4**	**100.0**	**22.8**	**56.9**
Belgian Investors	7.5			3.7
French Investors	0.0		13.1	4.7
Finnish and Japanese Investors	3.8			1.9
German Investors	5.5		55.2	21.6
UK Investors	0.5			0.2
US Investors	11.3		3.9	7.0
Other Foreign Investors	2.0		3.3	3.3
Total Foreign	**30.6**		**75.4**	**42.5**
Not Registered	0.0		1.8	0.7
Total	**100.0**	**100.0**	**100.0**	**100.0**[1]

[1] Error caused by rounding

Source: Hungarian Energy Office.

Table 6*a*. **Historical development of ownership in the Hungarian power industry**

Percent of total share capital

	Share owners					
Main Companies	MVM	ÁVÜ	Municipal	SZÉSZÉK	Foreign	Others
January 1992						
MVM	-	99.82	0.18	-	-	-
OVIT	50	43	7	-	-	-
Power stations	50	49	1	-	-	-
Distributors/ Retailers	50	47.54	2.46	-	-	-
October 1994	MVM	ÁV Rt.	Municipal	SZÉSZEK	Foreign	Others
MVM	-	99.82	0.18	0	-	-
OVIT	50	43	7	0	-	-
Power stations	46.7	45.74	0.97	6.56	-	-
Distributors/ Retailers	50	47.54	2.46	0	-	-
December 1998	MVM	ÁPV Rt.	Municipal	SZÉSZEK	Foreign	Others
MVM	-	99.82	0.18	0	0	0
OVIT	0	99.8	0.2	0	0	0
Power stations	61.5	0.46	0.7	6.56	30.6	0
Distributors/ Retailers	13.4	5.0	4.4	0	75.4	1.8

Source: OECD (1995), IEA estimate based on table 6 and International Energy Agency (IEA): *Energy Policies of Hungary, 1995 Survey*, Paris.

2.1.2. Functional model of the market: MVM as single buyer

67. The structural features of the reformed Hungarian electricity supply industry were effectively determined through the complex reallocation and sale of shares in the power companies. At present, the industry operates in a largely co-operative mode, as set out in the 1994 Electricity Act.

68. MVM is at the core of the industry and acts as a Single Buyer. It purchases electricity from public power plants (defined as plants that sell more than 60% of their output to the grid, as opposed to autoproduction plants) under long-term power purchase agreements (PPAs) and dispatches them according to a least-cost merit order. Generators are under a legal obligation to offer their capacity to MVM and maintain their power plants available for generation. Direct customer supply is allowed in only a very few, specific cases.

69. MVM initiates the process of capacity expansion if it estimates that new capacity is needed. In order to determine this, it monitors final demand trends and develops demand estimates. These are used for system planning at different time horizons.

70. MVM and OVIT are also responsible for the technical side of system operation, *i.e.* dispatch, system control and operation, maintaining adequate reserve capacity, operation, maintenance and expansion of the transmission grid and international interconnectors, provision of ancillary services, etc. Operation and maintenance work of the transmission grid is carried out by OVIT on the basis of contracts signed by MVM.

71. The power purchase contracts contain capacity, energy and mining capacity price elements, which are regulated by the Minister of Economic Affairs, based on preparatory work by the Hungarian Energy Office. The power purchase prices stipulated in the contracts with generators vary according to the characteristics of the plants. Some plants are old and have very low thermal efficiencies, so they produce at considerably higher cost, and there is no unique market price.

72. MVM operates under the so-called "least cost principle", *i.e.* it is required to buy its power at the lowest available cost. This principle requires MVM to seek out the cheapest option when capacity tenders are organised and additional supplies are contracted. Once a PPA is concluded, both minimum guaranteed power purchases by MVM from the generators and their prices are fixed. Based on these power purchase prices, MVM and its subsidiary OVIT manage dispatch. Dispatch is not governed by competitive short-term price bids.

73. There is only a very limited number of situations in which the least cost principle becomes active in the short term. One of these situations may occur when electricity demand exceeds the quantities MVM has contracted for. In this case, MVM can seek additional supplies from the public generators or autoproducers with excess capacity, or use its own reserve plants, or import electricity - MVM retains control of international electricity trade. Also, some of the generators are ready to offer some electricity below the regulated prices. Hence, competition at the wholesale level occurs only during the bidding rounds for new capacity, and to some very minor extent in actual generation.

74. On the downstream side, MVM has long-term power delivery contracts with the six distribution and supply companies. In principle, all power must be purchased from MVM. There is one single sales price for wholesale electricity, regulated and published by the Minister of Economic Affairs, based on preparatory work by the Hungarian Energy Office.

75. The 1994 Electricity Act contains no provisions of open grid access for third parties, although there were plans to introduce third party access over time. The six distributors/retailers enjoy exclusive supply licences. In some, so far exceptional, cases, the Hungarian Energy Office has issued direct supply licences to a generator, who may then directly generate and supply a customer. Licences for direct supply are based on Section 21 (3) of Act XLVIII of 1994, which prescribes that any power plant possessing a generation license can obtain a supply license for designated customers upon application. The conditions for obtaining such a license are:

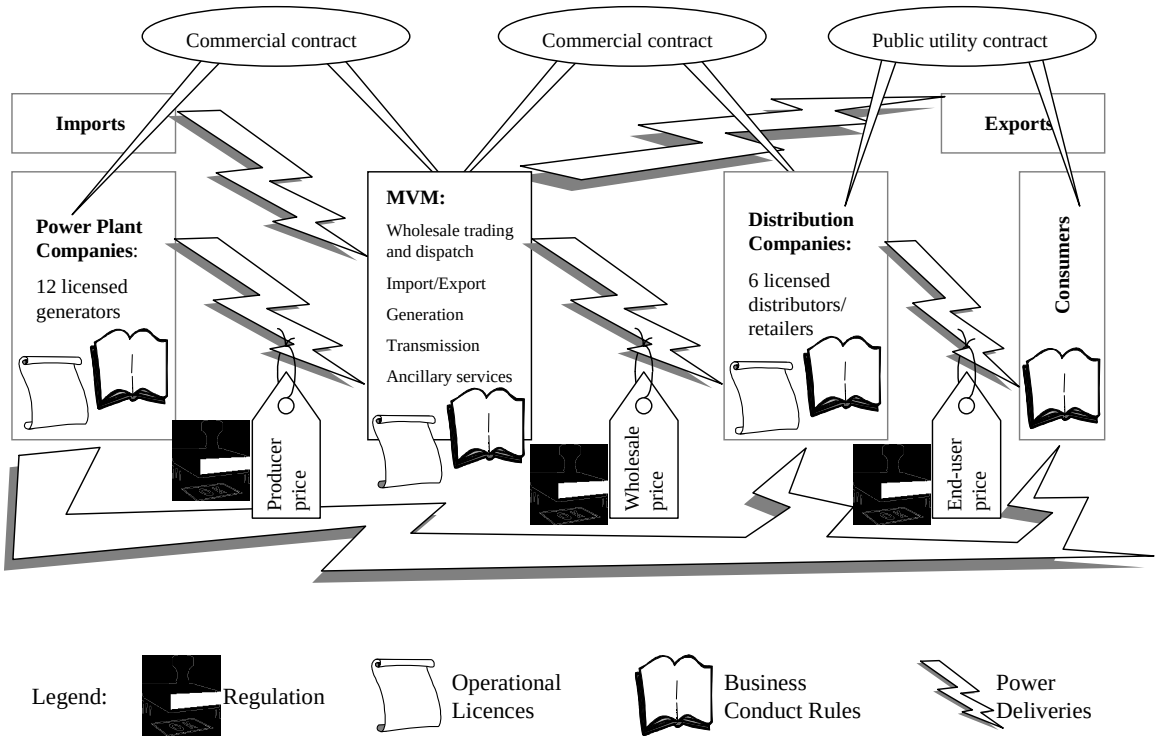
- The generator must be situated within practicable distance from the designated customer, and both must be connected through a direct power line;
- The generator must possess enough capacity for direct supply;
- The generator must possess a generation license.

At present, the Csepel Power Plant, EMA-Power Kft., and the Pécs Power Plant have a direct supply license.

76. Also, a holder of an exclusive supply licence may waive his right partly or fully to the benefit of other supply licence holder and upon approval by the MEH. Given the very exceptional character of direct supply, it can be said that there is no retail competition.

77. The distribution and supply companies conclude so-called public utility contracts with the customers. According to the 1994 Electricity Act, these can be general public utility contacts, between the retailers and the large number of individual small customers. These contracts are unlimited in time, and subject to the price setting authority of the MEH and the Minister of Economic Affairs. So-called individual public utility contracts are concluded between retailers and large customers. They are freely negotiated, without price control by MEH or the Minister, and are valid for a limited time period. If customers eligible for an individual public utility contract fail to find an agreement in their negotiations, the general public utility contract applies - *i.e.* the supply is based on the regulated prices for a comparable customer group. Figure 9 shows a simplified operational model of the Hungarian power supply system.

Figure 9. **Functional model of the Hungarian electricity supply industry**



Source: Hungarian Energy Office (MEH).

78. In the course of preparation for EU accession, Hungary is in the process of considering how the Hungarian system can be adapted to the EU Directive on the Internal Electricity Market. It is the Government's intention to open up the market for retail competition to the required extent upon accession. The new draft 1999/2000 Electricity Bill now under discussion is analysed in Section 2.2.

2.1.3. Regulation

79. The 1994 Electricity Act (Act XLVIII of 6 April 1994 On the Production, Transportation and Distribution of Electric Power) defines the general regulatory framework for generation, transmission, and supply of electricity. According to this general framework, the Hungarian power system is supposed to fulfil the following criteria:

- Its ownership is impartial. This is supposed to promote non-discriminatory behaviour towards all types of customers and other suppliers. It takes into account and helps represent customers' interests.
- It is controlled through legislation and regulation by public authorities.
- It serves consumers safely and at minimum cost.

- It covers its production costs, including the cost of necessary and warranted investment and efficient operation. Its prices include a rate of profit that is sustainable in the long term and allows sufficient investment.

- Operation and decommissioning of its plants are environmentally benign.

- It gives preference to renewable energies via a compulsory purchasing scheme for renewables.

80. The two main instruments of regulatory oversight provided for in the Electricity Act are, firstly, licenses for power plant construction, generation, supply, etc., and secondly, ongoing regulation in the form of price regulation and regulatory resolutions. The Minister of Economic Affairs determines end user prices via Ministerial Decrees. Decisions about the construction of new power plants are made by the Minister of Economic Affairs, the Cabinet or the Parliament, depending on the size of the plant. The Minister can also influence the structure of the industry and major capital transactions under rights conferred by the "golden shares" the Government holds in all power companies except MVM.

81. The Hungarian Energy Office (Magyar Energia Hivatal, MEH) has substantive regulatory powers that complement the powers of the Minister. Notably, it is responsible for:

- The preparation and implementation of the Minister's decisions, especially the detailed preparation of power plant establishment licenses and construction permits, as well as for licensing of generation, transmission, distribution and supply;

- Preparation of data for pricing decisions by the Ministry of Energy;

- Application of individual charges based on average pricing decisions and monitoring of the price formula and its constituents.

- Supervision of the operations of license holders, monitoring all important variables concerning the industry, providing information, and safeguarding consumers interests.

- Approval of the terms of contracts between the generators and MVM and between MVM and the distribution companies and mediating disputes between market participants.

- Monitoring and enforcement of the grid code, the dispatch code and the distribution code, that the MEH developed together with the interested parties in the electricity sector and other parts of Government.

82. Since 1 June 1999, the Hungarian Energy Office is also responsible for the surveillance of district heating, which is mainly carried out at local level in Hungary (Act XVIII of 1998 on District Heating). However, heat is often co-generated with electricity, and some of the partially privatised power generators also produce heat, which they sell on to local heat suppliers owned by municipalities. Currently, the debate centres around the conditions under which the generators can give up their heat generating activities. The duties of the regulator are described in more detail below.

Box 1. **The Hungarian energy office (Magyar Energia Hivatal, MEH)**

The Hungarian Energy Office was established in August 1994 under Act XLI of 1994 on Natural Gas Supply and Act XLVIII of 1994 on the Production, Transmission and Supply of Electricity. It is the regulatory authority for both electricity and natural gas in Hungary. It has the following core duties :

- Licensing of electricity generation, transmission, distribution and supply;
- Licensing of gas transportation, distribution and supply:
- Participating in and supervising the tendering and process for new electricity generating capacity and issuing the respective licenses after approval by the Minister, the Government and the Parliament;
- Supervising wholesale and retail prices, and especially preparing the Minister's price setting for gas customers and electricity consumers in the general public electricity system (smaller-scale customers);
- Ensuring consumer protection, adequate customer service, and reliability.

The Hungarian Energy Office is a government body with nation-wide authority and responsibilities regarding the regulation of the grid-bound industries. It is supervised by the Government though the Minister of Economic Affairs. The Minister appoints the President, the Vice Presidents, and the Director of Administration for an indefinite term of office. The Minister exercises the right of employer with respect to them.

The Hungarian Energy office has 85 staff, of which 13 are executives, 46 have higher education, 24 have secondary education, and 2 are manual workers.

Licensing and tendering

83. In the Hungarian electricity supply industry, activities subject to a licensing requirement are:

- Establishment and construction of a power plant of 20 MW capacity or above;
- Capacity extension or change of input fuel;
- Shutdown and decommissioning;
- Generation of electricity;
- Transmission and distribution of electricity;
- Supply of electricity to ultimate consumers.

84. The licenses are designed to ensure a minimum level of performance by the license holder, and provide the most important basis of ongoing industry regulation other than price regulation. They are issued by the Hungarian Energy Office, and can also be modified - or, in extreme cases, revoked - by it. Following the entry into force of the Electricity Act, the Hungarian Energy Office began to develop these licenses in 1995. Any of the licensed activities require that the entity seeking the license must be seated in Hungary.

85. Establishment and construction of new power generating capacity normally occurs in the framework of the capacity expansion plans prepared by MVM, although any company is free to put in an

application at any time. Development of domestic power generating capacity is also affected by the fact that the Minister of Economic Affairs has the right to decide, jointly with the Minister of International Economic Relations, how much electricity Hungary can import and export, and how much has to be produced domestically.

86. Based on the demand forecasts and system development plan prepared by MVM, and any possible modifications made to it by the Hungarian Energy Office, the Minister of Economic Affairs submits a power plant establishment plan to the Government and to Parliament every two years. Should there be applicants which propose power plants in accordance with this plan, the MEH can grant a preliminary license for power plant establishment. This preliminary license serves as a legal basis for the other compulsory licenses to be obtained from the authorities and for the state administration procedure to be conducted.

87. If there are no suitable applications, MVM issues a call for tender in close co-operation with both the MEH and the Minister. The winner of the bidding process is to be determined by MVM on a competitive basis in order to ensure the new capacity is sourced at least cost. Aside from the relevant economic criteria, the selection criteria also encompass items such as fuel diversity, the use of domestic energy resources and renewables, environmental externalities and social considerations, especially employment. The bidder is free to choose the site for the plant. MVM's decision is subject to review by the Hungarian Energy Office and by an independent consultant.

88. Application for the establishment of a new power plants must be made to MVM and the MEH, and must be based on a feasibility study that contains detailed descriptions of the technical and economic viability of the power plant project, its financing, its staffing with qualified operating personnel, proof of the applicant's past performance and management expertise, and a statement of the future customer of the power plant.

89. In order to obtain approval, power plant projects must fulfil the following minimum criteria:

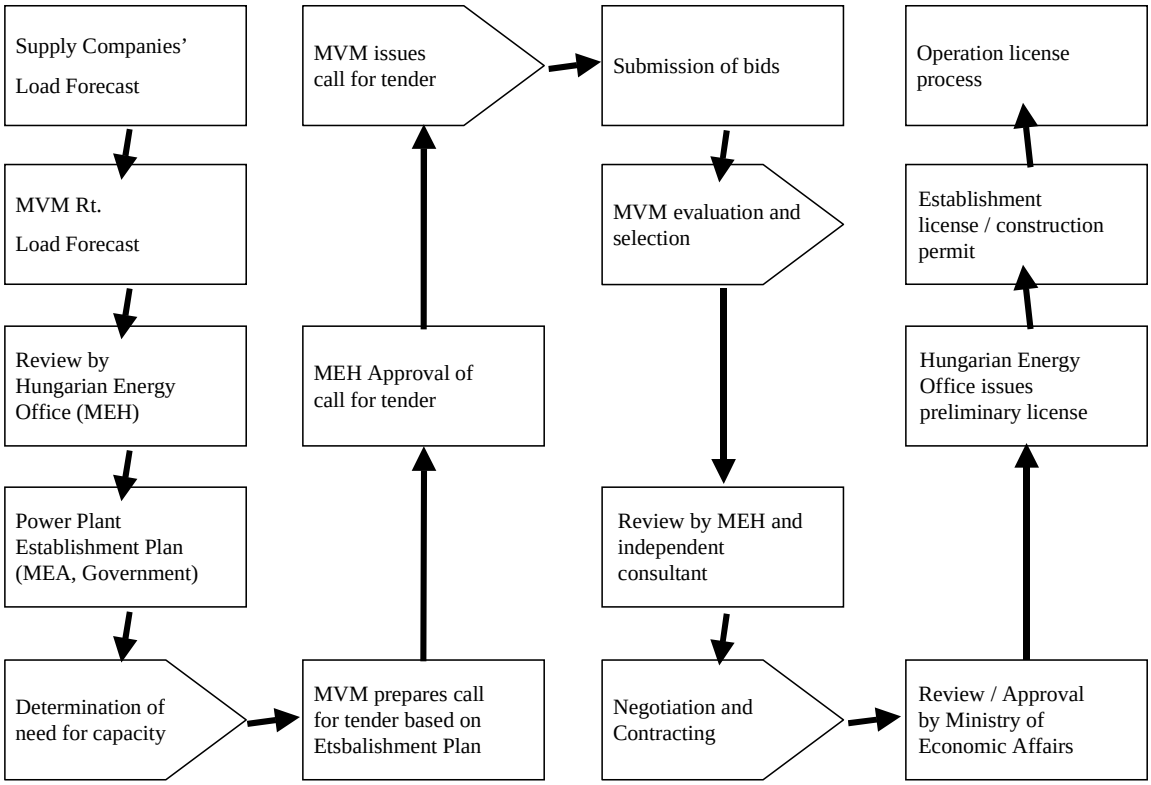
- MVM must deem the power plant necessary and need its generation;
- The power plant must comply with the applicable environmental regulations and the principle of lowest cost increase;
- The projected power plant construction must be in accordance with the domestic energy policy without causing any imbalance in Hungary's primary energy supply, *i.e.* without jeopardising security of supply through excessive reliance on one fuel or one supplier.

90. Approval is based on the MEH's preparation and opinion, but according to Section 4 of the 1994 Electricity Act, requires much broader consensus than that: for new power plants greater between 20 and 200 MW, approval from the MEH and the Minister of Economic Affairs is required, especially regarding fuel choice. Above 200 MW, the Minister of Economic Affairs must agree but must also seek approval of the entire Government. For power plant projects of 600 MW or more, the Hungarian Parliament has to approve. The Minister of Economic Affairs also determines minimum levels of fuel to be held in stock on the site of each power plant. If an application for power plant construction is issued by any of the incumbent generators, The Minister of Economic Affairs can also make use of the rights attached to the preferential (golden) share he holds in these companies, described in Box 2.

91. As a next step, a committee established under government decree no. 73/1996(V.22.) assesses the energy policy and environmental aspects of the proposed power plant project and organises and supervises

the public hearings that allow to taken into consideration the opinion of the community affected by the investment.

Figure 10. **Establishment procedure for new generating capacity**



Source: MEH.

92. Figure 10 shows the steps of the process to be followed for new capacity investment. The depicted tendering procedure applies to new contracts and generating plants of 50 MW or above, but also to new capacity in the form of major refurbishment, contract and plant lifetime extensions, and plant upgrades of 20 MW and above. The call for tenders specifies the total amount of capacity required, the time lines for capacity establishment, the fuel options as defined in the Government's power plant establishment plan, the type of plant (base load, load following, peaking capacity), possible transmission constraints that have to be taken into account, and in certain cases a price cap, *i.e.* maximum average price that the new plant can be expected to earn throughout its economic life.

93. The government submitted a power plant development plan to Parliament in December 1996. After discussion in various parliamentary committees and the plenary, the Ministry of Economic Affairs and the Hungarian Energy Office developed common principles on the licensing and bidding procedures which should precede any power plant construction. The entry into force of these common principles enabled MVM to organise a bidding procedure for new power plant capacity at the end of July 1997.

94. Two parallel calls for tender were issued by MVM. The first one invited investors to submits bids for a total of 800 ± 200 MW of smaller plants (between 20 and 200 MW), to come on stream between 2002 and 2004. This tender also invited applications for lifetime extension by more that 3 years and/or output

increases by more than 10% of existing power plants. Any input fuel except nuclear was to be accepted, but gas-fired power plants were limited to a maximum of 50% of the total capacity to be contracted for.

95. The second call for tender concerns a total of 600 MW of plant above 200 MW, to be installed between 2004 and 2006 and start commercial service one year later. This tender invitation covered a total capacity of 1 100 ± 300 MW. Natural gas was not accepted as input fuel.

96. 25 bidders responded to the first call for tender and submitted 63 proposals in total. The proposals amounted to 5 245 MW. The second tender generated 26 proposals made by nine bidders, covering a total of 8 000 MW.

97. Subsequently, demand forecasts showed lower-than-expected electricity demand. Therefore, MVM reduced the total capacity for bidding in January 1998. The first tender was reduced to 500 MW ± 200 MW, and the second one to 600 MW ± 200 MW. The new deadline for bids was 9 October 1998. Several proposals, including a proposal from MVM/Paks for new nuclear, missed the deadline, due, among other things, to delays in the required environmental impact assessments. The total capacity of bids successfully submitted amounted to 3 051 MW (24 proposals) for the first tranche and 5 473 MW (9 proposals) for the second tranche. Two winners were announced for the first tranche: AES-Főnix Kft.[18] for 191 MW on the site of Tisza 2 Power Plant for a combined-cycle gas turbine, and Kispest Power Plant Co. for a new 110 MW plant at its existing site. The winners in the second tranche were not publicly announced.

Merger control

98. Section 24 of the 1994 Electricity Act (Act XLVIII of 1994), Section 23 of Act LVII of 1996 on the Prohibition of Unfair Market Behaviour and Limitation of Competition, and Section 53 (2) b of Act XVIII of 1998 establish certain limits to vertical or horizontal concentration for the electricity and gas sectors. Under this legislation, license holders must seek approval by the Hungarian Energy Office and the Office of Economic Competition:

- Spin-off or separation of business activities;
- Merger with another license holder, if the merger results in a dominant position;
- Reduction of registered capital by 25% or more;
- Acquisition of ownership stakes of 25% or more of the concerned company's shares.

Actions taken on the grounds of orders by the Hungarian Energy are exempted from competition Law.

99. In accordance with these rules, the Hungarian Energy Office and the Office of Economic Competition have had to approve 76 changes in ownership interests since its establishment in 1994, most of which related to the privatisation of the energy companies. Among the most recent approved transfers was the share transfer of the Bakony and Pécs power plants from ÁPV Rt. and MVM to private investors.

100. Moreover, the Government can influence the structure of the industry and major capital transactions through the golden shares it holds in electricity generators and retailers (but not MVM). The rights attached to golden shares are detailed in the box.

Box 2. **The Government's rights attached to its golden shares in energy companies**

1) Special Rights

- Right to appoint or recall one or several members of the Board of Directors or Supervisory Board;
- Right to convene the general shareholders' meeting.

2) Right of Veto

- In case of modifications of the founding charter;
- In case of transfer of strategic assets;
- In case of merger, de-merger, or acquisition by another company;
- In case of change of the legal form of the company;
- In case of closing down an activity of strategic importance;
- Waiver of the exclusive right to supply.

Source: OECD (1997), *OECD Economic Surveys: Hungary* 1996-1997, Paris.

Price regulation

101. The 1990 Pricing Act (Act (Act LXXXVII of 1990 on the Definition of Prices, amended in 1992, Act, in force until 31 December 1996) and the 1994 Electricity Act are the two pieces of legislation which determine price regulation in the electricity supply industry. The 1990 Pricing Act distinguished between energy products with free prices (coal, liquid hydrocarbons, PB-gas, firewood) and products with regulated prices (the grid-bound energies, especially electricity, natural gas and district heat). For the former, the market was left to determine prices, which rose quickly to world market levels. For the latter, the authorities were to fix prices until 1 January 1997, by which time prices were expected to have risen sufficiently to cover costs.

102. The 1994 Electricity Act is in force until 31 June 2000 and stipulates that electricity price regulation must allow reliable electricity supply at "reasonable" prices. According to the Act, prices are to be determined by a formula. They must cover the costs incurred by efficient operators and ensure recovery of "reasonable" investment by the enterprises active in the market, including a "normal" profit, effectively a pre-announced rate of return set by the government. The MEH collects data and calculates average prices; the final decision on average end user prices is taken by the Minister of Economic Affairs. The Electricity Act provides the main legal basis for price regulation but there are numerous Decrees that set out its details.

103. In accordance with the Electricity Act, the Hungarian Energy Office can review or revise the level of electricity prices upon initiative of any of the interested parties, customers and suppliers alike. In 1997 and 1998, the Hungarian Energy Office received 43 applications for price revisions. In addition to this, and based on the 1990 Pricing Act, regular price adjustments are carried out annually upon the initiative of the MEH. Following a Decision taken by the Minister of Economic Affairs in December 1996, a quarterly price review mechanism was put in place in January 1997, but abolished in October 1998. The "pricing year" begins on 1 July of each year.

104. In every round of price determination, the companies in the market have to disclose all relevant information to the MEH. The MEH then prepares the new prices according to the methodology set out

below. The Hungarian Energy Office is the pricing authority at the intermediate levels of price regulation, *i.e.* at power plant company level for the purchase prices of MVM, and at the level of MVM, for the wholesale prices to the retailers. Price regulation is based on the principle that pricing for companies at each level of the industry should cover both capital and operating costs, and that the cost of purchasing electricity is to be passed through at each tier of the industry. Because the formula includes operational costs, a different price is established for each generator. The Hungarian Energy Office uses the average power purchase price and then establishes the costs of transmission and dispatch to set the wholesale price; finally it sets distributor margins to establish the average end-user tariff. The pricing formula, together with the work of the MEH in monitoring the operations of the various companies, is intended to encourage the "least cost" principle production and supply of electricity.

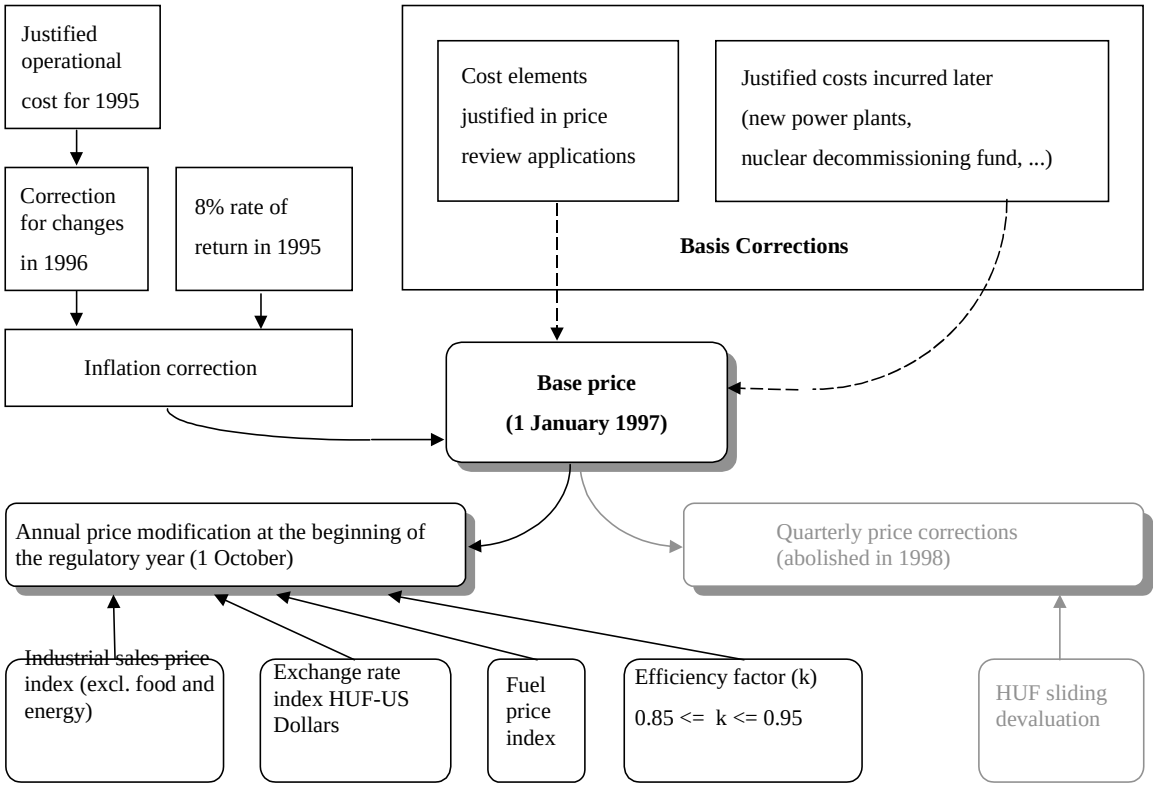
105. Companies submit applications for price increases, and the MEH prepares and adopts price resolutions, which are directly applicable. If companies disagree with the outcome, they can appeal directly to the Minister of Economic Affairs. If they also disagree with the Minister's decision, they can appeal to the courts. For end user prices, the final approval must be given by the Minister of Economic Affairs, and the new prices come into effect upon publication as a Ministerial Decree.

106. Figure 11 shows the current mechanism for end user price regulation used by the Hungarian Energy Office. This mechanism applies to prices for heat and electricity. The price prevailing at 1 January 1997 – the so-called starting price - is used as the basis for price escalation. This starting price was determined based on a cost survey of all concerned energy companies, carried out in 1995 and 1996 by external experts on behalf of the MEH. It contains justified operational costs, including all capital investment required for power production, as determined by the MEH in 1995/96. The MEH is, of course, aware of the fact that cost data concerning the past can be little more that rough cost estimates, due to the complete absence of market evaluation. In order to fulfil its function as price regulator, the Energy Office monitors electric utilities' costs on an ongoing basis, and attempts to put downward pressure on costs through its powers to disallow certain costs or cost elements.

107. Once the cost of electricity supply was determined, an 8% rate of return on investment, also fixed in 1995, was applied. After adjustment for inflation, this yielded the base price for 1997. After incorporating further corrections to the price basis, *i.e.* justified costs incurred or identified after 1 January 1997, the corrected price basis has been used to determine the new regulated price at the beginning of the regulatory year, which starts on 1 October each calendar year.

108. The corrected price basis is escalated using three indicators thought to be beyond the control of the utilities, *i.e.* the domestic industrial sales price index (excluding the energy and food sector), the exchange rate of Hungarian Forints versus US Dollars, and an index expressing fuel price movements. In addition, Hungarian utilities are expected to make efficiency improvements and reduce cost, so an efficiency factor k, reducing prices by 5% to 15%, is included. These factors are used for annual price regulation. The quarterly price adjustments are based on the changing value of the Forint.

Figure 11. **Pricing mechanism for electricity and heat prices**

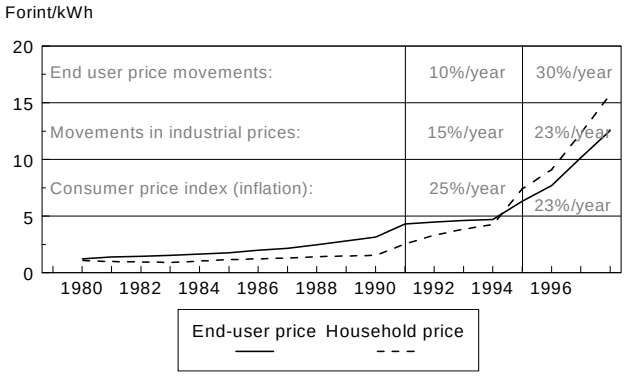


Source: MEH.

109. Within this legislative and regulatory framework, a difficult transition had to be accomplished between the very beginning of the reforms in 1991, and today. In 1980s, prices were far from cost-covering, and they were much lower for residential than for industrial customers, which indicates vast cross subsidies. Based on a commitment made by the Hungarian Government to the World Bank and the IMF, prices had to cover costs by 1996, and as of 1989, electricity prices started rising noticeably. Cost-covering prices meant that real prices had to rise 50% to 80% above their 1994 levels, according to the customer category. The prices that came into effect in 1995 had, for the first time, residential rates higher than industrial/commercial rates. Figure 12 depicts the development of end user prices since 1980. It shows that the rate of price increase picked up noticeably after the Electricity Act came into force and the Hungarian Energy Office was established. Table 7 details the nominal price increases between 1995 and 1999.

Figure 12. **End user prices for electricity**

1980-1998, in HUF



Source: MEH.

Table 7. **Total average price changes for electricity, 1995 to 1999**

Nominal

Year	Electricity
1995	78%
1996	2%
1997	39%
1998	13%
1999 (1st half)	7%
Total	207%

Source: Ministry of Economic Affairs.

110. In addition to the quarterly price adjustments, the Hungarian Energy Office received 12 applications for price increases from power generators, and 6 additional applications from the electricity retailers in 1997. Of the requested price increases, the MEH approved a very small amount, some 16%, on average. All electricity retailers and Vértes Power Plant Co. lodged complaints against these price resolutions. Following the complaints of the retailers, MEH had to carry out new proceedings, against which the supply companies also appealed in both instances. After their appeals were rejected, the suppliers began litigation procedures.

111. This dispute was not an isolated event. Throughout recent years, there were several disputes between the privatised energy companies on the one hand, and the Government and the Hungarian Energy Office on the other hand. These disputes concerned matters of principle as much the detailed handling of regulation. A long-running dispute on principles concerned the cost elements that were to be included in the price base for regulated prices. Similar disputes in the gas industry had led investors to threaten litigation. Controversies linked to excessive regulatory discretion arose when the Minister of Economic

Affairs chose not to follow the MEH's price proposals and revised electricity prices downward in the final Decrees. Also, the quarterly price adjustment was deferred twice in 1997, due to social considerations and upcoming Parliamentary elections. Eventually, all disputes were settled out of court, leading in each occasion to increased prices and the consideration of further cost elements.

112. The controversies were settled between December 1998 and mid-June 1999. Following this, both the Government and electricity companies stated that the electricity and gas prices coming into effect in July 1999 are now fully cost-covering and ensure an appropriate rate of return. However, the process of adjusting allowable cost in the rate base is bound to continue in the near future; for example, more stringent environmental regulation will cause additional costs that have to be considered.

Consumer protection

113. Apart from price regulation, the Hungarian Energy Office engages in other types of ongoing regulation. It collects and deals with customer complaints and becomes active in cases where a real violation of the legislative and regulatory framework is recorded. At present, the vast majority of customer complaints, especially the complaints by residential customers, do not give rise to further proceeding because the consumers are still ill-informed about their rights and duties under the Electricity Act.

114. The regulator also has an important role to play in ensuring the quality and reliability of electricity supply. Under the 1994 Electricity Act, it is responsible for developing so-called restriction lists. These lists determine which customers are cut off first, and to which degree, in the case of a power shortage. Interruptible-supply contracts are not widely used in the Hungarian electricity market. The Office also closely monitors various indicators related to unscheduled and scheduled outages, including number, duration, and voltage level of unscheduled outages. This information is obtained through reports which license holders in the power industry have to prepare in cases of unplanned outages and supply interruptions; yearly summary evaluations are also due.

115. Moreover, the MEH began developing measures for quality of service and customer satisfaction soon after its establishment. In 1995, it issued guidelines on the measurement of customer satisfaction levels. Starting in 1996, consumer satisfaction was surveyed with respect to five main subjects, such as meter reading, price levels, or handling of complaints. In 1998, this involved a random sample of 10 000 customers in all six service areas.

Environmental protection

116. Hungary is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) since 1994. Under Annex B of the Kyoto Protocol, Hungary is committed to reduce its carbon dioxide (CO_2) emissions by 6% in the time period 2008-2012 (six gases). As an economy in transition, Hungary has the right to choose its base year, and has opted for 1985-1987 as its base line period.

117. The time period between 1985 and 1987 marked Hungary's peak energy consumption. Due to the sharp decline of economic activity after 1989, CO_2 emissions from fuel combustion fell by 18% between these peak years and 1994. With a total of 62.0 million tonnes of carbon dioxide emissions in 1997, Hungary emits only very small amounts of CO_2. Due to the rather limited energy demand growth forecast by the Government in the period to 2010, emissions are not expected to grow much. A business-as-usual scenario developed for the Second National Communication on Implementation to the UNFCCC foresees emissions of 65.5 million tonnes of CO_2 by 2002 under very optimistic assumptions regarding economic development, this would only rise to 67.8 million tonnes. Nevertheless, the Kyoto commitment requires some improvements in energy efficiency.

118. The Government's policy measures in response to its commitments are set out in the National Energy Saving Programme. This programme was established in the framework of the Hungarian Energy Policy (Parliamentary Resolution 21/1993). This programme, adopted by the Government in 1995, aimed at analysing the current situation, the savings potential, and the ways in which the legal, institutional and financial framework of Hungary's energy efficiency policy could be strengthened. On the basis of this document, the Government adopted the Energy Saving Action Plan in 1996. This plan specifies four sets of policy measures:

- Greater penetration of renewables;
- Promotion of energy efficiency improvements;
- Energy labelling; and
- Education, information and promotion of technological innovation.

119. The mechanisms used under this action plan comprise, among other things, demand-side management, price setting to encourage energy saving, establishment of energy statistics and information systems, modernisation of heating systems and especially of district heating systems, development of technical regulations for buildings and supervision and enforcement of existing standards, development of energy data sheets for buildings, improving working conditions for the building authority, and improving the energy management of local governments.

120. The Government intends to increase the share of renewables to 5- 6%, which is almost double the current figure. Although the utilisation of wind energy, geothermal energy and solar energy is possible in principle, the use of biomass is seen as having the greatest potential in Hungary. Currently, there are more than 70 biomass-fired boilers, including in CHP for district heating, with a total capacity of 31 MW. This includes a large wood-fired boiler of 12 MW in Tatabánya. However, biomass is not competitive with natural gas in electricity generation or CHP, and requires extra financing.

121. However, the task at hand is so large that the country is not capable of financing everything on its own. Hungary is the recipient of a large amount of international finance to help improve its energy efficiency and modernise its economy from institutions such as the EU's PHARE programme, the World Bank, the Global Environmental Facility, or the German Coal Aid Revolving Fund.

122. The Ministry of the Environment has recently submitted to Parliament a bill on an environmental tax. The issue is, however, very controversial, as the tax would cause a drastic energy price increase and have a strong effect on inflation. No decision has been taken to date.

123. Whereas, due to the drastic reductions in energy consumption and emissions caused by the economic transition, climate change is a much less pressing problem in Hungary than elsewhere in the OCED, air pollution is still more of a problem and will have an effect on investment in the power market.

124. The 1995 Act on General Regulations concerning Environmental protection provides the relevant legislative framework for regulating air quality and atmospheric emissions. This is further developed by Government Decree 21/1986(VI.2)MT on Clean Air. Emissions limits from stationary sources are also established by the National Authority for Environmental Protection and Nature Conservation (OKTH), in co-operation with the Ministry of Health.

125. Most of the national ambient air quality standards set in these regulation are very stringent with respect to international standards. If the emissions limits set for stationary sources are not met, the OKTH

imposes an air pollution fine, calculated as a function of the amount of emissions exceeding the limit. If the necessary abatement measures are not taken, the fine increases by 20% each year for up to five years, and is then levied on an annual basis.

126. Hungary is in the process of adapting its emissions limits to the standards of the EU Large Combustion Plant Directive, among other things through Ministerial Decree 22/1998(VI.26)KTM, which specifies emission limits for the power industry. These norms apply for power plants above 50 MW. For newly-licensed power plants, these norms are already in force, but existing units will obtain an exemption until 2004. As noted in Section 1.3, a large number of power plants fail to comply with present environmental standards, and the environmental emissions of most power plants exceeds permitted levels, resulting in heavy fines under OKTH Regulation 4/1986 which are paid yearly by the non-complying power plants. The total amount of air pollution fines paid in 1997 was 347 million Hungarian forints (approx. US$ 2 million).

127. In 1997, the Government adopted a very comprehensive programme to combat all forms of environmental pollution, the National Environmental Programme 1997-2002 (Parliament Resolution No. 83/1997). This programme includes a number principles, such as the polluter-pays-principle and sets out detailed timetables for the adaptation of national legislation to stricter standards.

2.2. The future functional model of the ESI: competition?

2.2.1. The 1999/2000 electricity bill

128. As of late 1998, the Government began to draft new legislation for the electricity market. The new Draft 1999/2000 Electricity Bill is to replace the existing Act XLVIII of 6 April 1994 On the Production, Transportation and Distribution of Electric Power, which expires at the end of June 2000. For this reason, the Bill repeats numerous provisions already present in the 1994 Act, notably those that set out the framework for the administrative set-up of the Hungarian Energy Office, the methodology of price regulation, or the various licensing requirements.

129. More importantly, the new bill is supposed to make the Hungarian electricity market compatible with Council and Parliament Directive 96/92/EC of 19 December 1996 *concerning common rules for the internal market in electricity*, commonly referred to as the EU Electricity Directive, in preparation for the country's EU accession. Hungary aims to join the EU by 1 January 2002. By this time, it will have to have transposed the majority of the legislation valid in the EU, or at least have taken significant steps to do so. This requirement includes the provisions on competition in the electricity and natural gas markets.

130. The Hungarian Government strives to have an EU-compatible electricity market in place by 1 January 2001, and in order to comply with this tight schedule, began circulating draft versions of the Bill to interested parties in early 1999, inviting comments. The draft is available on the Government's Internet website in Hungarian.

131. The following analysis is based on a draft issued in June 1999. A further draft was issued in September 1999, and a third one in December 1999. The following also reports the most important changes between the June, September and December drafts.

132. It was the Government's objective to have the Bill adopted by Parliament towards the end of 1999 or in early 2000. This was considered necessary in order to ensure a seamless transition between the 1994 Electricity Act and the new Bill. The provisions replacing the 1994 Act (Art. 14 to 26) will then come into force on 1 July 2000, whereas the provisions concerning the competitive electricity market (Art. 1 to 13

and 27 to 80) will come into force six months later. The following describes the main features of the competitive electricity market, as provided for in the draft Bill. The provisions of the Bill as set out in this report will be interpreted and analysed in Section 3.4.1.

133. The Bill distinguishes two markets, which will be referred to as the "utility" market on the one hand, and the "authorised" market on the other hand.[19] In the "authorised" market, "authorised" or "qualified" customers are to be able to buy electricity from any power plant, including both "public" and "private"[20] power plants, any wholesaler, or any retailer. This corresponds to the section of the market that is eligible for competition under the Directive.

134. The "utility" market corresponds to the current set-up of the power industry. "Utility" customers continue to buy electricity under "utility" contracts from "public" suppliers. "Public" suppliers are retailers that have an obligation to supply the "utility" market within a region – they are identical to the six regional electricity distribution companies. They continue to buy their power from the "public" or "utility" wholesaler, who, in turn, continues to source his power from "public" power plants.[21]

135. Art. 27 establishes one utility wholesaler as the central entity in the utility market who, through the right conferred to it through its license, enjoys exclusive rights as far as its regular business activities are concerned. This comprises all of the following transactions.

136. Public generators are under the obligation to offer their electricity to the utility wholesaler. The conditions of their deliveries are to be fixed in power purchase contracts. The utility wholesaler is under the obligation to supply the utility market, *i.e.* the total demand of utility customers, covering the entire national territory, and using the output of public generators (Art. 59). There is no requirement on the utility wholesaler to refrain from any other activity in the power market, but all vertically integrated power companies must unbundle their accounts according to Art. 77.

137. Utility suppliers enjoy exclusive supply rights in their geographic area and are under the obligation to supply with respect to their utility customers. They have to buy the total amount needed to do so from the utility wholesaler (Art. 60). Relationships between public suppliers and final utility customers are determined by utility contracts, concluded for an indefinite period of time.

138. Prices continue to be regulated throughout the whole supply chain in the utility market, notably for all of the following steps (Art. 70):

- Power generation;
- Transmission;
- System control;
- Wholesale deliveries to utility suppliers;
- Distribution;
- Utility supply of final customers.

139. The exact scope of the "authorised" market remains as yet undetermined. Following enactment of the 1999/2000 Electricity Bill, the Government would have to define by Decree which power customers are in principle eligible to participate in the competitive power market. This group of customers is called qualified customers. In order to become fully eligible to switch suppliers, a qualified customer has to give

notice to his utility 6 months prior to terminating his contract. Once his contract terminated, he becomes an authorised customer (Art. 61).

140. The Draft 1999/2000 Electricity Bill authorises the creation of an Electric Power Exchange (Art. 63), to be further defined by specific legislation and to be placed under the surveillance of the Hungarian Energy Office. Under this legislation, the MEH is to prepare and supervise the operation of the Power Exchange, and it approves the Power Exchange Code. June draft of the Bill states that this Power Exchange is to be open to wholesalers and producers, not to retailers or ultimate consumers. The September version of the Bill states that eligible customers can participate in the Power Exchange as well. The December 1999 version of the Bill states that the transmission system operator has to accommodate the transactions concluded in the Power Exchange (Section 21).

141. Any licensed power trader will also be allowed to engage in foreign trade with electric power. For this purpose, such a trader needs a foreign trade license, to be issued by the Hungarian Energy Office. The license may be withheld in cases where electricity imports jeopardise the life and health of Hungarian residents, or in which the imported power does not meet the standards for safe and stable operation of the Hungarian grid (Art. 64). If these conditions are fulfilled, foreign trade licenses are awarded regardless of the country of origin of the imported electricity, EU or other. In the December draft, these provisions were amended and now explicitly mention eligible customers as entitled to import power, alongside the electricity traders (Section 31), but this is still subject to an individual foreign trading license (presumably one per transaction). Hungarian power imports were also made subject to an explicit reciprocity clause (Section 31). Eligible customers (presumably even if they are large enough to be a member of the power exchange) are not allowed to re-sell part or all of the power they bought.

142. The relationships between the “utility” and the “authorised” market are as follows: public power plants can offer any power generated above their utility commitment to the "authorised" market (Art. 46 (2)). In case of necessity, the utility wholesaler can purchase power from the "authorised" market, including the Power Exchange, or from abroad. Likewise, in case of excess supply, the utility wholesaler can sell power into the "authorised" market (Art. 59).

143. Further, the Draft 1999/2000 Electricity Bill provides for the establishment of one National Dispatch Centre/Co-ordinator and several regional dispatch centres/co-ordinators, which appear to be the equivalent of the independent transmission and distribution system operators provided for in the Electricity Market Directive. These centres are to be responsible for all services needed for safe, reliable and stable operation of the supply system and the transmission grid. Their independence is to be ensured through the provision that any licensee authorised to carry out the duties of the Dispatch Centre/Co-ordinator is not entitled to perform any other function in the electric power industry. Dispatch centres are not allowed to divulge information qualified as confidential by the market participants (Art. 57).

144. The National Dispatch Centre is to contract for reserve capacity as well as for ancillary services. All power generators can offer stand-by output to this institution. The prices for these services are to be controlled by the Hungarian Energy Office. Moreover, the National Dispatch Centre will be given the right to charge high, punitive prices for remedial action in situations in which the transactions of a market participant jeopardise system stability. These prices are to be set by the Hungarian Energy Office (Art. 74).

145. In emergency situations, the National Dispatch Centre can suspend trading and disallow transactions or instruct generators to make their generation available, regardless of existing commercial contracts (Art. 47). In the December version of the Bill, a new provision relating to such situations was introduced. According to this provision, MEH is to monitor cases in which market trading is suspended upon request by the affected user. MEH can order resumption of normal trading with immediate effect if it finds the suspension unjustified (Sections 17 and 18). Moreover, and presumably for emergency situations

of longer duration, the Government can restrict electricity supply to customers, order authorised customers to make their contracted supplies available to the utility market, and alter the commitments and rights allocated to market participants under their licences (Art. 78). Insofar as market participants' behaviour in the crisis situation was reasonable, they are not liable to pay compensation to ultimate consumers. The Hungarian Energy Office is to deliver an opinion on the reasonableness of their actions. However, compensation is due if suppliers fail to give sufficient advance notice of scheduled outages to customers, or if a supply disruption arises out of suppliers' negligence (Art. 51).

146. The transmission company and the distribution companies are responsible for ensuring supply to all customers, and also for development and extension of the transmission system if. If an increase of demand or new connection requires grid extension or reinforcement, the grid company can obtain a financial contribution from the supplier who may, in turn, apply for a corresponding rise in his price ceilings if his supply prices are regulated. Such transactions are exempt from Value Added Tax (VAT) (Art. 50). Under Section 13 (3) of the December draft, the National Dispatch Centre (*i.e.* the transmission system operator) can invite bids for tender for transmission system extension and development.

147. The grid-owning companies are under the obligation to open their networks to power plants and electric power wholesalers in a non-discriminatory way, provided there is spare capacity (Art. 52). In the December draft, explicit mention is made that network access must be non-discriminatory (Section 15). However, in cases of insufficient grid capacity, supply of utility customers has automatic priority over supply of authorised customers (Art. 53 (2) in the June draft, Section 16 (2) in the December draft).

148. Market participants have the right to construct direct transmission lines (Art. 41). In the June draft, the provisions relating to the right-of-way for these transmission lines differ significantly between the "utility" market and the "authorised" market. The respective rights of land use for power plant construction show the same difference. The generators or transmitters in the "utility" market enjoy so-called cable right, which confers extensive rights to carry out preliminary works (tracing, measurement, soil testing etc.) on real estate owned by third parties, before and without any assent from these parties. If necessary, expropriation of the required lands can be carried out, the cost of which will *not* be borne by the "utility" licensee. Also, such licensees can use land in public ownership free of charge (Art. 30 to 35 and Art. 39 to 40).

149. In contrast, the land used for the construction of private power plants or transmission lines cannot be obtained through expropriation but only through "right of use", which requires an agreement between with the owner of the real estate and appropriate monetary compensation. Public lands can only be used on the basis of individual authorisation and a fee (Art. 36 to 38 and 41). In the September draft of the 1999 Electricity Bill, the differences between the "utility" and the "authorised" markets regarding the right-of-way were abolished.

2.2.2. The Business model of the Hungarian electricity market

150. The provisions of the draft 1999/2000 Electricity Bill are further clarified in a document entitled "Principles of the Hungarian Energy Policy and the Business Model of the Energy Sector", issued in the Summer 1999. This document sets out the steps towards the introduction of competition into the power market. It contains:

- A detailed timetable for market opening and adaptation of legislation and regulation until 2002:
  - New electricity legislation is to be in place in the first half of 2000;

- The Independent System Operator is to be established in the first half of 2000;
- The first step of electricity market opening is to occur on 1 January 2001;
- A new Gas Act is to be adopted by the first half of 2001;
- An energy conservation programme comprising measures for the power sector and covering the time period up to 2010 is to be in place by end-November 1999.

- The establishment of nine working groups in which all interested parties can discuss the draft Bill with the Government.
- An experimental market opening of 10% of domestic demand to competition by 1 January 2001. The 10% figure corresponds to the part of the market that is not currently covered by long-term contracts;
- Opening of the market for consumers above 100 GWh annual consumption (corresponding to 13.5% of the Hungarian market) immediately upon accession, still planned to occur by 2002;
- The creation of a separate, state-owned, non-profit company for transmission and distribution operation during the first half of 2000;
- Merger of the sections of the transmission grid that are currently owned by MVM and OVIT into one unified transmission company. This new grid company as well as the Paks and Vértesi power plants are to become independent companies fully owned by MVM as a holding company.

151. In addition, the document announced that transmission tariffs and a mechanism to address stranded cost will be developed.

2.2.3. Adaptation of regulatory procedures

152. The imminent changes in the Hungarian power market obviously require adaptation of regulatory practices, some of which are already outlined in the draft Bill. These changes mainly affect licensing and price regulation; merger control and consumer protection are somewhat less affected, notably because the Hungarian Energy Office already controls all ownership modifications that affect more than 25% of the share capital of any of the larger industry players.

Licensing

153. Licensing is mainly affected in the sense that the number of activities in the electricity supply industry requiring a license increases. In principle, licensing remains within the responsibility of the Hungarian Energy Office, except for item 7., construction of new transmission lines. Here, the Minister of Economic Affairs will have to define by decree which authority is to be responsible for issuing the relevant licenses (Art. 6 and 4 (2) bc). When the new Bill enters into force, the following activities will require a license (Art. 14 to 29):

1. Establishment and construction of a power plant of 50 MW or above.

2. Capacity extension.

3. Change of input fuel.

4. Shutdown and decommissioning.

5. Power generation.

6. Transmission of electricity.

7. Construction of a transmission network/grid extension.

8. Distribution of electricity.

9. System management at national level.

10. System management et regional level.

11. Electricity trading.

12. Wholesale trading of electricity in the "utility" market.

13. Supply of ultimate consumers.

154. Items 1. to 6., 8., and 13. already require a license at present; here, the possible changes only affect the content or procedure of the license. Items 7. and 9. to 12. are new.

155. The licensing procedure regarding construction of power plants (item 1.) remains virtually unchanged. This means that it remains a process characterised by two main steps:

1. Application for and granting of a license of principle, based on a feasibility study containing all technical and economic data, the results of an environmental impact assessment, and information about financial coverage and expertise of staff. This license is valid for two years, extendable once by two more years.

2. Application for and granting of a construction permit. This step involves consulting an experts' commission (defined in special legislation), seeking the opinion of the authority responsible for land use on siting, and a public hearing, which is to determine whether or not constructing the plant is in the public interest. The license is granted for a fixed period of time, extendable once.

156. If during the second step, the authorities conclude from the public hearing that the plant is not in the public interest, the construction permit can be withheld. Construction permits are equally valid for fixed time period, to be specified in the license and extendable once. The permits can be amended and revoked in cases of major delays. The main differences compared to the legislation presently in force are that:

- Establishment of private power plants does not require any license (Art. 20);

- The threshold beyond which a license is required was raised to 50 MW (from 20 MW); and that:

- The threshold beyond which the Minister of Economic Affairs has to approve the choice of input fuel was raised to 50 MW (from 20 MW).

157. An operating license (item 5.) will be necessary for all power generation which is not part of the “utility” market/purely autoproduction. However, if the power plant is to operate in the "utility" market, the resulting commitment is fixed in the license. Operating licenses are valid for fixed terms and can be extended.

158. In contrast, the licences granted for electricity transmission and distribution (items 6., 7. and 8.) as well as for system operation at national and regional level (items 9. and 10.) are granted for an indefinite time period. The licences for system operation confer exclusive rights to carry out this activity, as do the licences for utility wholesale trading and utility supply (items 12. and 13.). However, the wholesaler and the regional retailers in the utility market are free to cede all or part of their activities to other licence holders and upon approval of the Hungarian Energy Office.

159. To obtain a license for electricity trading (item 11.), financial cover is required in the form of a bank guarantee of 1 month of turnover. The MEH may also require electricity traders to prove that they have guaranteed access to a minimum amount of electricity generation through ownership in generation.

Price regulation

160. At present, prices are regulated at three levels: wholesale purchase prices (between the generators and MVM), wholesale sales prices (between MVM and distributors), and retail prices. The future model of the Hungarian power market as set out in the Draft 1999/2000 Electricity Bill will make it necessary to further disaggregate price regulation. Thus, the Bill provides for the following list of services for which separate regulated prices have to be developed (Art. 73):

1. Power generation in the "utility" market
2. System operation
3. Transmission
4. Distribution
5. Power sales from the wholesaler to the retailers in the "utility" market
6. Retail supply of final customers in the "utility" market.

161. Although the Bill does not explicitly state that the price cap regulation currently in use should be abandoned, Article 73 in the June version does stipulate that regulated prices must allow a "reasonable" return on investment and a profit “enabling long-term operation” in addition. The general rules and procedures of price regulation are to be determined by the Minister of Economic Affairs, who also retains the power to set average values for regulated prices for each of the six items listed above (Art. 4). The December 1999 draft even reinforces the price-setting powers of the Minister. It contains a table (table in chapter XII, Section 85) that states explicitly that all regulated prices will continue to be regulated by the Minister of Economic Affairs. MEH is to provide preparatory itemised cost analyses. Moreover, Article 73 stipulates that the cost of maintaining reserve capacity, decommissioning of power plants and their related coal mines, and environmental protection measures should be included in the prices to ultimate consumers and that regulated prices must be free of price discrimination. Renewables may receive subsidies up to a level to be determined by the Minister of Economic Affairs (Art. 75).

162. In addition, it requires that regulated prices should promote safe supply at the lowest possible cost, but also reflect/

1. The objectives of overall economic and energy policy
2. Security of supply
3. Environmental protection
4. The state of the world economy.

Administrative procedures

163. In addition to these changes, Articles 6 (3) b), 8 and 10 contain a potentially important modification to administrative procedures. As of entry into force of the 1999/2000 Electricity Bill, the President of the Hungarian Energy Office will obtain the rank of State Secretary, and the Vice President will be Deputy State Secretary. Under Hungarian Law, this allows the MEH's Vice President to act as the first instance of appeal against decisions taken by the MEH, whereas the President acts as the second instance. This might weaken the Minister of Economic Affairs' role in the appeals process.

3. EVALUATION

3.1. Restructuring and privatisation

164. General government policy, including energy policy, is based on a multitude of goals. These encompass, to name but a few, economic prosperity and efficiency, stability and security of supply of all vital inputs to the economy, a clean environment, and an 'equitable' distribution of wealth. While competitive markets may be an objective in their own right, their main merit lies in the fact that they appear to bring about economic prosperity better than any other type of market or economic system. Their effect on security of supply, the environment, and distribution is less uniform. These objectives are, and ought to be, promoted through specialised government policies. These policies should be compatible with competitive markets, because experience shows that prosperity often makes it easier to enhance security, environmental quality, and distributional equity.

165. The progress Hungary has made to restructure its electricity supply industry, especially the divestiture of generation and distribution assets from MVM is impressive, keeping in mind the very difficult starting position. In 1990/91, MVM was a fully vertically integrated state monopoly that imported record amounts of electricity from the Former Soviet Union, burdened with a large amount of outdated, economically and technically obsolete generating capacity, distorted prices that lay way below cost, extreme internal subsidies in favour of residential customers, leaving it unable to face the inevitable re-investment cycle, necessary to maintain reliability, on its own.

166. Compounding these weaknesses, the cost of generating, transmitting, distributing and supplying electricity was not even known and had to be estimated in painstaking work carried out under the MEH's initiative and supervision years later. Also, the cross subsidies from industry towards households created a need for an internal compensation scheme between the regional distributors – because industrial customers were concentrated in the north and north-west, these regions had to finance the low-price but high-cost south.

167. Seen against this background, the progress that Hungary has made, first in unbundling the accounts of MVM, then creating viable power and distribution companies, and eventually – partially - privatising most of them, is more than impressive, and Hungary has achieved an industry structure that can provide a starting point more suitable for competition than some long-standing OECD member countries. All this was achieved in a much more precarious macro-economic situation than most IEA member countries have known: the painful transition in all sectors of the economy from a centrally-planned, command-and-control system towards a market economy meant that the necessary price increases created much more social hardship than it would in many OECD member countries. Although the progress towards liberalisation did not occur in a linear way, and although at times progress appeared to stall on certain issues, such as the design of fully cost-covering regulated prices, the progress made in the last eight years is tremendous.

168. From the outset, the Hungarian Government struggled with the same issues as any OECD member government intent on privatising and liberalising its power industry, only perhaps in a more intense form. In many countries, privatisation is one of the main drivers of reform, often to relieve a burden from the government's budget or obtain funds for it, or to obtain private investment where the incumbent utility is unable to provide the necessary investment. There is some tension between this objective and the other important functions of the government as (indirect) share owner, as legislator/regulator, and as re-distributor, responsible for social cohesion.

169. The process surrounding the privatisation of power plants and their prior combination with coal mines illustrates the difficult path that had to be negotiated in Hungary in this respect. Integration with the coal mines proved a burden on the sell-off of the power plants, and the Vértes plant is still not sold. On the other hand, the conflict between ÁVU and ÁV Rt. regarding the timing of privatisation illustrates the conflict of interest which existed within the Government between the necessity to raise funds quickly to be able to pay off international debt, the desire of the Government as an indirect shareholder to realise the maximum value from the sale, and the necessity for the Government as legislator/regulator to take enough time to design a viable and effective structure for the new market. There is a need to disentangle these conflicting roles some more in future.

170. At present, the Hungarian power industry has reached a state of relative stability which compares rather favourably to the situation in the power industry of most OECD member countries just prior to full liberalisation.[22] It should be noted that at present, there is virtually no competition in the Hungarian power industry. Despite the unbundling that has occurred, MVM can essentially behave like a vertically integrated, regulated monopolist, due to its position as electricity wholesaler and long-term planner and developer of the power industry. Vertical integration occurs mainly via long-term power purchase agreements, not via ownership. No competitive entry, *i.e.* no entry against the will of MVM, can occur, because MVM decides whether or not new capacity can be constructed, and if so, how much and what kind of capacity. The next step must be the introduction of competition. In designing the 1999/2000 Electricity Bill, the Government has taken the first steps to do so. The challenge ahead is to design rules that allow effective competition. One of the most important elements of effective competition is that competitive entry is made possible, and even encouraged, through non-discriminatory access to the industry's vital infrastructure.

3.2. Regulation

171. In the present system, regulation occupies an important place in the Hungarian power market. This is an important achievement compared with the past. This past was characterised by the failure to acknowledge, at a general level, that the individual's self interest could be harnessed into a very powerful force supporting societal welfare, given the right incentives, and that, at a practical level, the activities of

state-owned companies were not necessarily beneficial for the "common good". Consequently, many of the institutions needed in a modern power market were missing, as were the accountability and the checks and balances that are built into the institutions and their rules in many OECD countries.

172. Subsequently Hungarian Governments had to learn "running" a modern power market and building the institutions and rules necessary for it in real time while the changes occurred. Moreover, almost every reduction of inefficiencies in the system led to redundancies in an environment of macro-economic instability and high unemployment, and to price increases in an environment of low per-capita GDP, compared to most other OECD countries – Hungary's per capita GDP still lies some 80% below the figure for IEA Europe.[23]

173. The difficulty of achieving all this simultaneously once more highlights how much progress Hungary has made in the last decade. Many of the features of Hungary's regulatory institutions are efficient. Electricity is subject to competition Law. Hungary has a specialised regulatory body, the Hungarian Energy Office, and it has a competition authority which exerts antitrust surveillance of the industry. The Hungarian Energy Office is responsible for the detailed preparation of all major regulatory decisions, and has significant regulatory powers of its own. Price regulation is, in principle, based on an established, publicised regulatory formula, according to established and transparent procedures and, again in principle, to a pre-established timetable.

174. The regulatory formula is based on a mix of rate-of-return and price cap regulation. Rate-of-return regulation was used to establish the base price for 1997. This figure determines average revenues and is subsequently used for the development by the Hungarian Energy Office of detailed end user prices. This base price is inflated annually using a price cap mechanism. The price cap follows the formula used in the UK and elsewhere: a price index is reduced by a target efficiency factor and increased by a factor for pass-through of input costs that are considered beyond the suppliers' influence. The resulting figure provides a ceiling for price increases in the annual review rounds.

175. Rate-of-return regulation is essentially cost-plus regulation, whereas price cap regulation allows the regulator to exert real pressure on costs, at least in principle. However, price cap regulation is effective only if the regulator manages to set appropriate values for the efficiency factor and the cost pass-through factor. Practical experience in liberalised power markets throughout the OECD shows that this is very difficult. Essentially, regulators have no instrument which tells them reliably what the regulated company's marginal costs are and what they would be in a competitive market. If the efficiency factor is too lax, the pressure on cost is negligible, if it is too stringent, rates of return shrink, and in extreme cases, suppliers may even make losses. If the power industry offers rates of return far below other industries for a long time, investment will eventually be reduced, leading to reduced reliability and poor service for the regulated sections of the industry. If regulators understand this, they may raise prices to levels that attract sufficient investment, and thus re-introduce a rate-of-return element. Vice versa, if price caps are not stringent enough, regulators may investigate companies' costs and tighten the price cap; this occurred in the UK in the early days of liberalisation. Thus, price regulation in practice often turns into a mix of price cap and rate-of-return regulation. This has also happened in Hungary: aside from the fact that the base prices was developed using a rate-of-return element anyway, electricity (and gas) suppliers in Hungary have also managed to obtain inclusion of additional cost elements into the base price since the beginning of the privatisation process.

176. As investment in power generating capacity is still comparatively long-lived and still involve sunk costs, regulators may attempt to circumvent the lack of information and exert very strong pressure on costs without having to fear that suppliers will immediately leave the industry in large numbers. They may use the vehemence with which the companies protest as an indicator of whether regulated prices are moving in the right direction and nearing marginal costs. This indicator is, of course, unreliable, because

companies have a strategic interest in overstating their point. In practice, no regulatory mechanism can emulate the effects of competition, and regulated prices are per se incompatible with the principle of lowest possible costs that is enshrined in Hungarian electricity legislation. Hungary may well stipulate cost minimisation in its legislation, but costs will not be minimised as long as there is no competition. However, some prices in the power industry will have to be regulated in future. Also, price regulation across the OECD and all regulated sectors of the economy have been plagued by these problems of regulatory practice. Countries have adopted various ways of coping with these issues but no panacea has been found. In this sense, Hungarian methods of regulation are based on generally accepted regulatory principles.

177. Nevertheless, the Hungarian regulatory system is not consistent with OECD best practices. The institutional set-up of regulation in Hungary causes concern. Although the Hungarian Government has created the Hungarian Energy Office in an effort to base regulation on efficient, non-discriminatory and transparent procedures, it has stopped short of giving this body full responsibility for regulation, or the regulatory process sufficient transparency. The Minister of Economic Affairs still retains the most important regulatory powers, *i.e.* the right to set end-user prices, the right to approve power plant construction, and the right to influence major ownership and capital transactions via the "golden" shares. Since all of these require the participation of the MEH, and most are actually based on the MEH's preparatory work, the work Energy Office greatly contributes to the efficiency and transparency of regulation. But its decisions can - and were on several occasions in the past – overridden by other considerations not necessarily in accordance with these objectives, such as the desire to win Parliamentary elections.

178. The Minister's final authority over end user prices opens the door towards price distortions motivated by all kinds of concerns relating to macro-economic developments, social policy objectives and regional policy considerations, to name just a few. OECD member countries which have had this type of institutional set-up in place have not had encouraging experiences with it, especially in times of high inflation or distributional conflicts, where the temptation to tamper with energy prices as a "quick fix" for deeper, structural problems can become overwhelming. In the same vein, the Minister should be replaced by the judicial system as the first instance of appeal. At present, the courts are the second instance of appeal, after the Minister. It is encouraging that the 1999 Draft 1999 Electricity Bill contains a provision that would remove the Minister's responsibility from the appeals procedures, but much less so that he is to retain price setting authority. It is of crucial importance that the Hungarian Energy Office be mandated to exert definitive, independent control over regulated price and that its autonomy be strengthened.

179. In order to ensure a functioning competitive power market, it is necessary to separate the task of price control and allocate it with the MEH, and the political responsibility for overall economic policy, situated with the Minister of Economic Affairs, even though this move will create a certain amount of friction. The reason for this is that the regulator's task is to emulate as closely as possible the outcome of a competitive market in markets which are not fully competitive, *e.g.* due to natural monopoly. Any failure to do this inevitably leads to inefficiencies. Although such inefficiencies may appear small in the short term, they may still be very costly to society in the longer term. The reason for this is the pivotal role of the price mechanism in steering demand as well as future investment, technology use and development, and even research. In contrast, the Minister's role is much wider and comprises objectives such as macroeconomic stability and a certain degree of re-distribution of wealth. These objectives are often in conflict with the goal of efficiency. The shorter-term imperatives of reducing inflation, for example, may lead to a strong temptation to reduce those prices that the government can control below their optimal level, sometimes even below cost. This leads to delayed adaptation in the concerned sector, excess demand, reduced or deferred investment, and ultimately to poor service quality and environmental strain. This situation was experienced by some long-standing OECD member countries after the oil crises.

180. A related issue that needs to be given further attention is the independence of the Hungarian Energy Office. The fact that the Minister of Economic Affairs exerts the right of employer towards the President and Vice President of the Energy Office may open possibilities for undue pressure on this crucial regulatory agency, despite the fact that outright removal from office appears to be difficult.

181. It is also important to establish the regulator as a strong institution, appropriately staffed, and endowed with sufficient resources and far-reaching rights for company data disclosure. The task of emulating prices that would emerge, were the market competitive, is tremendous and requires considerable specialised knowledge and frequent use of computer-based economic modelling, or at least the capability to outsource modelling work to appropriate organisations. This task cannot be carried out by any institution other than a specialised regulatory body. A Parliamentary committee, for example, would be more than overwhelmed by such a task and deliver inadequate work.

182. Under the current draft of the Electricity Bill, the scope of regulation is bound to increase strongly, because activities formerly carried out by MVM and lumped into the company's wholesale sales price must now be disaggregated. The task at hand is daunting, and steps have to be taken quickly to tackle the most important issue, transmission pricing.

183. Price regulation, especially if it is to persist in parts of a competitive market, must not be captured by any particular interest. This applies in particular to the prices for transmission and distribution grid services as well as grid access conditions, because they can determine whether the competitive playing field is level or not, which in turn affects whether competitors enter the Hungarian market. Therefore, the Hungarian Energy Office should be given the mandate and resources to develop efficient, non-discriminatory and transparent transmission and distribution tariffs, based on international experience, as soon as possible. The same applies for grid access conditions.

184. The role of the competition authority becomes more important when the electricity sector is liberalised. In particular, the competition authority must protect the sector from abuses of dominance, such as exclusion from markets and discrimination in access to transmission, anti-competitive agreements, and mergers which tend to create or extend a dominant position. It is important that the competition authority can be consulted and to make its views known as an independent entity, especially regarding regulations which could aid or hinder the development of competition in the electricity sector.

185. Efforts to increase the independence of the Hungarian Energy Office are under way since Summer 1999. Notably, the Government is developing a specialised piece of legislation to form the legal basis of the MEH. This would remove the definitions of the regulator's rights and duties from the Electricity Act and the Gas Act that provide the legal basis at present.

3.3. Effects of regulatory reform to date

186. In any attempt to measure the success of regulatory reform in the power industry, the development of end user prices, and especially the extent to which they have fallen after the introduction of competition, is the most important indicator used. Due to the country's past as a centrally-planned economy, this indicator is not useful. The degree to which prices cover marginal cost, or data indicating the development of cost, would be a much better indication of the improvements of economic efficiency that have been accomplished. However, this information is unavailable. Suffice it to state that the mere fact that prices have increased dramatically since 1995, illustrated in Section 2.1.3.3, may be taken as an encouraging sign in itself. Also, electricity companies started making profits in 1997, which appear to have increased in 1998. Hence, assuming that prices are now fully cost-covering, future price reductions might result from the introduction of competition.

187. Employment in the power industry rose from 33 875 employees in 1980, to a peak of 44 746 in 1994, right after the combination of power plant companies with the coal mines, which had increased staff in the combined industries by some 13 800 coal miners. By 1998, employment had fallen again to 39 636.

188. In the absence of more relevant price and cost data, consumer satisfaction is another interesting indicator to measure the success (or failure) of regulatory reform. Table 8 specifies consumer satisfaction levels, based on surveys carried out by the Hungarian Energy Office since 1996.

Table 8. **Aggregate consumer satisfaction indices for Hungary's electricity supply**

Scale 1-100

Power retailer	**1996**	**1997**	**1998**	**1998-1996**
Dédász Rt.	69.5	67.4	65.4	- 4.1
Démász Rt.	67.9	69.8	71.1	+ 4.2
Elmű Rt.	60.5	64.8	67.6	+ 7.1
Édász Rt.	64.8	68.1	74.1	+ 9.3
Émász Rt.	66.3	69.3	70.7	+ 4.4
Titász Rt.	65.1	65.5	66.3	+ 1.2
National average	**65.7**	**67.5**	**69.2**	**+ 3.5**

Source: Hungarian Energy Office.

189. The table shows that consumer satisfaction has clearly increased over the survey period at national level and for all retailers except Dédász Rt. Best performers were Édász Rt. (North-West Hungarian Electricity Supply Company Ltd.) and Elmű Rt. (Budapest Electricity Supply Company Ltd.). Generally, satisfaction was highest in meter reading and worst in handling of complaints (except for pricing). According to MEH data, security of supply, measured as the number of kWh lost pro customer in unscheduled outages, has hardly changed between 1992 (0.7 kWh lost pro customer) and 1997 (0.726), with a temporary peak in 1996 (0.895).

3.4. The introduction of competition

3.4.1. The 1999/2000 Electricity Bill

190. The Hungarian electricity supply industry has been reformed to a point which is only a few steps away from effective competition. The additional steps require introducing competitive rules and the corresponding institutions, and improving the regulatory institutions as regards their independence, transparency, and regulatory powers; the industry structure would have to undergo only minor reform, in comparison to what has already been achieved in the recent past.

191. Unfortunately, the Draft 1999/2000 Electricity Bill does not appear to reflect the tradition of bold reform that Hungary has come to be known and appreciated for. It presents only minor progress, and there is significant doubt as to whether it would allow any effective competition. The June draft of the Bill contains a large number of gaps, some of which are clearly listed and left to be settled by the Government or the Minister of Economic Affairs by Decree. Others are not recognised or acknowledged and would have to be settled once the first disputes emerge, if the Bill were to be adopted as is. In addition to these gaps, the June draft contains some provisions which may act as real obstacles to competitive entry. In the September draft of the Bill, some of these gaps were addressed and some of the obstacles were removed.

These issues will be analysed below. Beforehand, a short sketch of the likely future functioning of the Hungarian power market will be attempted.

The likely future of the Hungarian electricity supply industry

192. Given the structure of the power market at present, it is reasonable to assume that the future "utility" market will consist of MVM as the exclusive wholesaler, that the current licensed generators will be the future public power generators, and that the six distributors and retailers will continue to perform their present role.

193. The new institutional elements are the independent system operators (the national and regional dispatch centres) for transmission and distribution, as well as the fact that extension of the transmission system can apparently be undertaken by others than MVM or OVIT, respectively. Authorisation of direct line construction between a generator and an eligible consumer is, of course, a requirement under the EU Directive, but the creation of a non-exclusive license for transmission grid extension appears to introduce greater freedom than the minimum standard set in the Directive.

194. The "authorised" or "qualified" market co-exists with the "utility" market. The interactions between both markets remain rather limited:

- Public power plants can offer any power generated to the "authorised" market.
- The utility wholesaler can sell power into the "authorised" market in case of excess supply.
- The utility wholesaler can purchase power from the "authorised" market, including the Power Exchange, or from abroad, if necessary.
- All power generators can offer stand-by output to the system operator.

195. As a consequence of this, the sources of power generation for eligible customers will be:

1. "Private" power plants built specifically for the "authorised" market;
2. Industrial autoproducers who have spare capacity;
3. Electricity imports from abroad, imported by electricity traders with an import license;
4. Public power plants who can generate above their utility commitment;
5. MVM, if it has excess supply (spot purchases).

196. Following the amendments of the September draft, eligible consumers can also buy power from the Power Exchange. However, the power traded on the Power Exchange will itself stem from the sources listed above. The December version of the draft Bill explicitly forbids eligible consumers to re-sell electricity they imported in the Hungarian market, which also works towards restricting the depth and liquidity of the Hungarian power market. Significant amounts of generation can, in the foreseeable future, only be expected to arise from item 1. and 3. Whether or not electricity imports are economic depends on the relative prices for electricity and the surrounding market, *i.e.* the EU. Hungary's industrial electricity prices used to lie some 30% below German and Austrian prices. Hungarian prices continue to rise, whereas the introduction of competition in Germany and Austria has recently led to price reductions which were dramatic in some cases, bringing prices down to Hungarian levels. However, it is open to question whether

these effects will be robust in the longer term. If they are not, imports from EU countries cannot be expected to be a significant source of power supply to Hungarian eligible consumers.

197. Competition might still arise from non-EU, non-CENTREL Member countries, especially from Hungary's eastern and south-eastern neighbours Ukraine, Russia, Romania, and Bulgaria. These countries are still interconnected within the UPS/IPS power system which is not synchronised with the Hungarian system any more. This means that imports would have to occur over dedicated DC lines, AC-DC converter stations, or from dedicated power plants in the exporting country. It is possible that some of Hungary's neighbours could offer power at prices below those prevailing in Hungary now, and thus constitute real competition. However, the line construction or equipment needed to import this electricity is costly, the quality and reliability of the imported electricity may not be sufficient for Hungary's stricter standards, and it is by no means clear that this electricity is not exported at subsidised, below-cost prices. Hence, competition from these countries may well not arise, and if it did arise, it is not clear whether the outcome would be efficient.

198. Item 1., construction of power plants dedicated to the authorised market, cannot be expected to bring about supply in the short term.[24] Whereas a combined-cycle gas turbine (CCGT) can be constructed and operational in less than two years nowadays, this pre-supposes that natural gas is tolerated as an input fuel, that sufficient gas supplies can be secured,[25] and that the necessary permits and licences can be obtained without delay. It unlikely that all of these pre-conditions will be met soon after market opening in Hungary. Hence, the crucial question is how much generation can be made available to the "authorised" market from source 2., and especially from source 4.

199. At present, there are no prospects for large-scale competition to MVM from public power generators in the liberalised market. According to the legislation in force now (Section 2.1.3.1), all new public power projects must be deemed indispensable by MVM for its own supply purposes, which of course still cover the entire market except for autoproduction. Such capacity is at present constructed under long-term power purchase agreements with contract terms up to at least 15 years. Unless the Government introduces a provision into the Draft 1999 Electricity Bill that requires re-negotiation of all long-term PPAs after the opening of the market, MVM will have sewn up nearly all available capacity in the market. At present, the Bill contains no such provision. The Government should make sure long-term contracts can be opened for re-negotiation of these long-term contracts. It should ensure that the Hungarian Energy Office can examine all long-term supply contracts for clauses that restrict competition, such as any rights of pre-emption for MVM if its customers obtain a more advantageous offer from another supplier.

200. This situation could be interpreted as being simply an outcome of market forces: if Hungarian electricity prices, of course to a large degree determined by MVM's sales, remain below EU prices, and eligible consumers cannot find any other competitive supply source, this could be taken as meaning that the even the partly liberalised market has properly allocated a scarce, cheap resource. The argument would, of course, be faulty. The benefits of competition stem not only from low prices[26] but to an even larger degree from the pressure to reduce costs. Whereas the current capacity tendering represents a rough attempt to emulate this effect, the amount of pressure on cost would become much stronger if the system was opened to a larger degree, and the resulting cost and price decreases would be larger.

201. Linked to this discussion of the sources of possible competition and the development of prices is the issue of stranded costs. In principle, stranded costs cannot logically be expected in the Hungarian electricity sector. Stranded costs are defined as unamortised costs, prudently incurred (*i.e.*, examined by the relevant regulator who agreed to their recovery under regulated prices) under the prior regulatory regime, that will not be recovered under the new, more market-based regulatory regime. In other countries, stranded costs are mostly attributed to private utility investments, often in nuclear generation.

202. In Hungary, by contrast, no private utility made investments before the end of 1995. Two possibilities exist. The first is that state-owned utilities could incur stranded costs. The second is that the asset buyers thought they were buying assets subject to one regulatory regime, the regime was subsequently changed, this regime created stranded costs, and they should be compensated for them. The fallacy of these two will be demonstrated in turn.

203. The concept of stranded costs is an accounting concept, since amortisation defines them. Hence, they should be considered from an accounting, rather than an economic, point of view. Changes in the value of state-owned assets are not usually reflected in national accounts. (For example, wear and tear on public highways and ships sunk in battle do not show up in national accounts.) Hence, while the change in regulation would, in general, change the market value of the state-owned assets, this does not show up in the accounts.

204. There is, however, a real economic effect from the change in regulation. If the change in regulation causes revenues from the electricity assets to decrease, then the State must decrease its outlays, borrow more, or increase its income from elsewhere. This means that the burden of this change in regulation is borne by those who no longer benefit from the now-diminished outlays, future taxpayers, or current taxpayers. The beneficiaries of this change in regulation are purchasers of electricity. In general, the distribution of burden is different from the distribution of benefit: Some individuals "win," netting out the costs and benefits, and other individuals "lose." However, the total benefit of the reform should have exceeded the total burden, else it should not have been undertaken. Redistribution of wealth is a common effect of economic policies. While there are legitimate reasons to take the political decision to reduce or reverse the redistribution that results from electricity reform, there is no logical reason for that decision to be linked to any sunk costs. Rather, the reduction or reversal is just another, independent example of redistribution. Many commentators see, however, this redistribution as necessary transfers to ensure that coalitions of individuals made worse off by the reforms do not block reform that is, overall, beneficial.

205. The second issue is a "fairness" issue, whether the regulatory regime changed unexpectedly after the electricity assets were partially sold. By the time the assets were sold, generation had not been declared a natural monopoly when transmission and distribution were so declared. (*Competition Policy in OECD Countries, 1994-1995*, p. 471) Generation assets had been divided among several different companies and were being offered for sale separately. In the early 1990s Hungary was already amending its laws pursuant to its association agreement with the European Union, and the discussions leading to the adoption of the EU Directive by the Council of the European Union (EC 96/92) in December 1996 were already well-advanced. Thus, bidders had to anticipate that any future regulatory framework would allow at least limited competition in generation and end-user choice of supplier. Indeed, at that time Hungary might have chosen to liberalise as much as countries like the United Kingdom and Chile. The same holds for any long-term power purchase agreements.

206. In any case, stranded costs only occur if the equilibrium market price that forms in the competitive power market. It is unclear whether electricity prices in Hungary will when competition is introduced in Hungary; since the country simultaneously opens itself up to the wider EU market, and since it has comparatively low electricity prices at present, despite the drastic price rises since 1994, its prices may well remain stable once consumers from other EU countries can buy Hungarian electricity. These issues depend on a number of imponderables, including the question whether power imports from Ukraine, Russia or Romania will be possible and economic. However, in order to be prepared for any claims, the Hungarian Government should devise mechanisms that can be used to identify and measure stranded cost, if only to verify those claims. It would be important to fix a clear date for stranded cost claims, after which no stranded cost claims will be considered; this should be the moment in time when Hungary decided to join the EU. Mechanisms for mitigation and reimbursement of stranded costs should also be designed in preparation for possible claims.

Gaps in the June draft of the 1999/2000 Electricity Bill

207. As mentioned above, there are a number of explicit gaps in the Bill. By far the most important gap is related to the question, who qualifies as an eligible customer. The size of the "authorised" market remains to be determined by the Government via Decree. Determining the exact degree of market opening in Hungary is not necessarily a trivial task: as of February 1999, end users with an annual electricity consumption of 40 GWh and above became (theoretically) eligible for competition throughout the EU except in Belgium, Greece and Ireland. Whereas this represents some 25.4% of power demand throughout the EU, it only concerns 43 large customers in Hungary, representing some 18.9% of total consumption. The next step, due in the year 2000 and concerning users of electricity consumption of 20 GWh and above, concerns 95 end users with a market share of 24.3% in Hungary but 28% throughout the EU. The last step of market opening (9 GWh and above) concerns 200 end users or 29.2% of the market in Hungary but 34% throughout the EU. The Hungarian Government is considering at the moment whether it would have to seek a derogation upon entry into the EU, depending on when this occurs.

208. However, as far as the EU Directive is concerned, the percentage shares of market opening overrule the GWh thresholds - their function is only to provide an objective measure of the share of the market which must be opened at the moment when the threshold becomes active. This means that in the year 2000, all EU power markets must be opened to the community-wide market share of all customers using 20 GWh and above - whatever this share may be. Based on the assumption that electricity use will continue to grow slowly, it is likely that the share of market opening will diverge from the 28% in upward direction, if it does divert. This means for Hungary that full compliance with the Directive amounts to opening the market for customers below 20 GWh annual demand "…except a if derogation is sought and granted".

209. Other gaps to be addressed by the Government or the Minister of Economic Affairs relate to standardised minimum provisions of supply contracts, the procedure to be applied in cases of unforeseen power shortages, details of the licensing procedure, the supervisory authority for new transmission line construction, the general mechanism for price regulation, etc. An even longer list of tasks is set out for the Hungarian Energy Office; importantly, this includes the (technical) conditions for grid access of authorised customers, and "the rules related to contribution to network development".

210. While the gaps that are explicitly acknowledged are certainly important to fill, there are others which are not acknowledged. The latter are much more serious omissions and need to be included with very high priority.

211. First and foremost: it is not clear what the conditions for grid access are. The Draft 1999 Electricity Bill appears to provide for regulated grid access, since Art. 52 stipulates an obligation to allow access and Art. 6 (1) refers to regulatory oversight over the technical conditions of grid access and the need to design rules for network development. It does not appear that negotiated grid access is what the Bill intends for. Negotiated grid access does not guarantee a level playing field for competition allowing easy competitive entry. This can only be guaranteed by regulated grid access.

212. But the relevant provisions are neither clear nor complete. No reference is made to the necessity to develop non-discriminatory, cost-reflective transmission prices – a formidably complicated task that crucially determines the "evenness" of the competitive playing field and that must be accomplished before liberalisation.[27] The Hungarian Energy Office should be instructed to turn its attention to the development of transmission prices immediately and with highest priority. If necessary, entry into force of the Draft 1999 Electricity Bill should be deferred until at least the basic principles of transmission rates have been established.

213. Second, Article 63 of the June draft states:

> *Electric power wholesalers may form an electric power exchange in compliance with the provisions of a special Act.*

While the creation of an Electricity Exchange is an indispensable ingredient of a liquid competitive market, the benefits of competition will be severely reduced unless all market participants, including generators, wholesale and retail traders, and eligible consumers, have access in principle to the Power Exchange. Article 63 should be clarified and amended in this sense. This has, in fact, occurred in the September version of the draft Bill.

214. Third, the relationship between the "utility" market and the "authorised" market needs to be clarified in a number of areas. The three most important areas are highlighted by the following questions:

1. Can an authorised customer revert back to utility service? If so, under which conditions?

To address the market power of incumbents, many competitive power markets oblige utilities to resume service to an eligible customer who has switched suppliers but wishes to return to the utility. Unless such a provision is enacted, utilities can threaten not to resume service before the customer leaves. In this case, the benefits of switching suppliers have to be very obvious. This would allow rather large inefficiencies in the incumbent utility. The Government should provide for return and define non-discriminatory conditions for it. Provisions to this effect were built into the September and December drafts (Section 29).

2. Can authorised customers, traders or generators obtain back-up or top-up from the "utility" market?

The current draft of the Bill does not make any provision for possible top-up or back-up deliveries from the utility market to authorised consumers. Denial of such deliveries may not deter customers from departing, but in practice, situations in which authorised customers need – and take - such deliveries are likely to arise, especially if the Electricity Exchange is not open to ultimate consumers. A price mechanism should be developed for back-up and top-up with and without notice. This price mechanism should be based on the spot price (or, if unavailable, short-term system marginal cost) in the "utility" market.

3. How is cross-subsidisation from the utility to the authorised markets going to be prevented?

So long as activities in the utility market are subject to cost-based regulation, companies that are active in both markets will have incentives to evade regulation and load up common costs, or even costs wholly attributable to the authorised market, onto the compensated cost accounts of the utility market. This evasion can be countered only with costly and intrusive reviews of the accounts.

Obstacles to competition in the June draft of the 1999 Electricity Bill

215. Aside from these areas in need of further clarification, the June draft of the Bill contains a number of potential obstacles to competition. These provisions are not only likely to tilt the competitive playing field in favour of MVM and therefore stifle competition, but also they are clearly incompatible with the spirit of the EU Electricity Directive. Whether they are compatible with the letter of the Directive is likely to be a matter of in-depth legal analysis, but the provisions give rise to serious doubt.

216. First, Article 52 (2) states:

The conditions of the network access may not be discriminative. Such conditions may not give reasons to abuse and may not provide unreasonable restrictions, but they also may not endanger the safety of supply and the quality of services.

217. Article 53 (2) states:

a) Priority shall be given to any delivery carried out to the benefit of utility customers,

b) As a second priority deliveries carried out for the interest of authorised customers shall be accomplished."

218. It is not infrequent to find that grid access is made conditional on the availability of network capacity in competitive markets – this arises clearly out of the practical necessity to ration transmission demand to existing capacity. However, the question of which transactions enjoy priority when capacity is constrained is a different matter. Where ever in a competitive market the incumbent utility is allowed to give its own customers priority, this is done on the grounds of pre-existing contracts or commercial arrangements, often based on interruptibility clauses in the contracts. In principle, it is the price mechanism which rations demand to the existing capacity, both in long-term contracts and spot transactions – which again highlights the importance of efficient transmission prices.

219. Article 53 (2) clearly attributes priority to utility customers as such and under all circumstances. No consideration is given to the possible existence of transmission contracts. Read against Article 52 (2), the underlying philosophy of these provisions appears to be that whoever chooses a supplier other than MVM must implicitly accept less secure, lower quality service. In their current form, these provisions are openly discriminatory and may well be in conflict with the EU Directive. The Government should ensure that MVM allows non-discriminatory grid access, and that curtailment in situations of grid overload is based on interruptible service contracts, revealing consumers' preferences for reliability of supply, to equal conditions for all customers.

220. At present, the Hungarian Government is discussing ways in which grid access can be made non-discriminatory, while at the same time ensuring that captive customers enjoy the highest possible reliability standard. The Government should focus its attention on allowing and facilitating the use of interruptible service contracts for all parts of the supply chain. The public utility contracts for captive customers could then specify non-interruptible services for generation, transmission, distribution and supply, and thus ensure reliability, while other customers can choose between reduced reliability at lower and high reliability at higher prices.

221. Second, Article 30 to 42 in the June draft set out the conditions for land use and right-of-way for power plant and transmission line construction, including the necessary switchgear, transformers, etc. As noted in Section 2.2.2, these provisions differ significantly between the "utility" market and the "authorised" market. While generators and transmitters in the "utility" market enjoy so-called cable right, allowing preliminary works on real estate before and without any assent from the owners, expropriation can be carried out at no cost to the licensee, and public lands can be used free of charge, in the "authorised" market generators and transmitters must seek consent of real estate owners and pay appropriate compensation for the use of both private and public land. Again, these provisions are openly discriminatory and must be revised to ensure competitive neutrality and EU-conformity. The September and December drafts contain equal conditions for both market segments in this respect.

3.5. Comparative assessment of Hungary's regulatory reforms

222. An important way of evaluating the progress a country has made in regulatory reform is cross-country comparison. This method generally works well across most OECD countries and is indeed frequently used in the context of assessing regulatory reform.

223. There is, however, no easy way of comparing Hungary's reforms with the reforms in most other OECD countries and reaching meaningful results. This is due to the fact that, like other transition economies, the set of electricity reforms Hungary has completed represents essentially an exercise of catching up with the establishment of institutions and procedures developed in the market economies over the last 50 to 100 years. In contrast, the first functioning competitive power markets are no more than 10 years old.

224. Hungary has without doubt benefited from relatively recent experiences made in the OECD, but its first wave of reforms has essentially brought it to the level of some OECD member countries before these countries introduced competition, or only very slightly beyond. The Hungarian system today is fully vertically integrated, mainly through long-term power purchase agreements but also through ownership. Power plant dispatch is based on long-term, regulated prices. Price regulation contains an efficiency factor that is meant to exert pressure on costs, but the incorporation of additional cost elements into the rate base, justified as it may be, nevertheless amounts to cost-plus regulation in practice. In this sense, the Hungarian power industry may not contain more incentives for efficiency than the UK's Central Electricity Generating Board did before the competitive UK power market was created.

225. One feature that is different is the bidding procedure for new generating capacity. Bidders compete by offering their power plant project at the lowest possible electricity sales price to MVM. During every bidding round the effects of competition – productive efficiency, which reduces costs, and allocative efficiency, which reduce prices - are at work once, at the generation level. Whether any of these efficiency improvements are ever passed on to ultimate consumers is unclear, and once the capacity is contracted for and installed, there are hardly any more incentives for efficient operation and efficient capacity replacement (dynamic efficiency) from competition. The system is reminiscent of the power industries in developing countries, such as Indonesia or the Philippines, where foreign power companies build and operate capacity for the incumbent utility which often remains in state ownership.

226. The difference is that Hungary has a developed regulatory system. While this system may not be as independent from the Government as it should be, it goes significantly beyond both the CEGB and an IPP set-up.

227. Another reason why it is difficult to draw direct comparisons between most OECD countries and Hungary is that the centrally-planned economy has affected the development of electricity prices in a major way. Below-cost electricity prices and ample cross subsidies have meant that regulatory reform towards greater efficiency and competition result in rising electricity prices, unlike in most OECD countries where regulatory reform and competition are introduced to reduce prices.

228. On the other hand, the second wave of reforms that is currently under preparation in Hungary is not yet defined in sufficient detail to allow much comparison, and certainly does not allow drawing any conclusions about the efficiency gains to be expected. It is only possible to compare the broad outlines of the system that are already determined. According to these, the country will opt for a combination of a centralised, non-competitive market segment and a competitive market segment for eligible consumers. While most liberalising power markets go through a transitional phase during which the traditional, centralised segment of the power market co-exists with a newly competitive segment for those consumers that are already eligible, the maintenance of a permanently centralised market segment is a feature of the

European Union power market. Within the EU, only Portugal, Italy, and, for a transitional period, Germany, plan to adopt this system.

229. Table 9 provides an overview of number of other features that are important for a competitive power market. It should be noted that Hungary plans to open its market for the 100 GWh consumers by the time it accedes to the European Union, *i.e.* in 2002 or 2003. Hence, the initial 10% market opening should be interpreted as a tentative opening only, to be followed by further opening of 13.5% soon after.

Table 9. **European electricity market reform**

as of September 1999

Country	**% of EU Demand (2235 TWh)**	**Market opening**		*Independent?*		**Generation**
		Fraction	**Year**	**TSO**	**Regulator**	**Ownership**
Germany	22%	100%	1998	no	no *	private/Länder + municipal
France †	17%	35%	2003	no	no	public
UK	14%	100%	1999	yes	yes	privatised
NordPool (Swe, Nor, Fin)	14%	100%	1996	yes	no	mixed
Italy	11%	40%	2002	no	yes	public/divest
Spain	7%	100%	2007	yes	yes ‡	privatised
Netherlands	4%	100%	2007	yes	no	municipal/ privatised
Belgium	3%	40%	2006	no	no	privatised
Austria	2%	50%	2003	no	no	mixed
Hungary †	2%	10% 13.5%	2001 2002	yes	yes ‡	mixed
Greece †	2%	35%	2005	no	no	public
Denmark	1%	100%	2003	no	yes ‡	municipal/coop
Portugal	1%	35%	2003	no	yes	mixed
Ireland	1%	32%	2003	no	no	public
Luxembourg	0%	45%	1999	no	yes	mixed

Notes: † National legislation not in place as of 1 September 1999.
‡ Independent regulator with limited powers.
* competition authority is fully responsible.
TSO = transmission system operator.
NordPool data does not include Denmark.
Source: European Commission and IEA.

4. CONCLUSION

230. Hungary has made tremendous progress in modernising the electricity supply industry and its regulation in the last decade. MVM T. was fully centralised, government-owned, overstaffed, indebted company with heavily distorted prices in 1991. Today, the power industry is restructured, partly privatised, and its prices are cost-covering. Recent bidding rounds for new capacity suggest that the Hungarian electricity market as it stands at present is attractive enough for investors to ensure that the imminent wave of capacity replacement will be carried out in time and bring major technological and environmental improvements. A regulatory authority is established, and many aspects of regulation are efficient. The Hungarian power industry has been reformed to a point where the introduction of competition is merely a few steps away.

231. What is largely missing from the current operational model, as well as from the current reform proposals, are the regulatory and legal pre-conditions for effective competition. MVM is both run and regulated in a much more effective way than at the beginning of the decade, but the only competition occurs in tendering rounds for new capacity, if MVM has determined the need for new capacity.

232. The reform legislation that is currently under debate is not sufficient to introduce effective competition. Competition benefits ultimate consumers in multiple ways, through lower costs (productive efficiency), lower prices (allocative efficiency), and timely introduction of new technologies and methods of production (dynamic efficiency). This is brought about in two ways: through the "carrot" of profit for efficient market participants, and the "stick" of loss for inefficient ones. It appears that the current model of the Hungarian power sector, as well as the model chosen for the future – which represents remarkably little progress over the current situation – strive to rely on a somewhat limited use of the "carrot" effect: the competitive market segment is to be carefully phased in at the margin of the power market, starting with the 10% of demand which are covered by spot purchases anyway, subsequently rising according to EU legislation upon Hungary's EU accession. MVM is to retain control over the vast majority of the market.

233. However, competition only shows its full effect if the "stick" completes the "carrot". Only if inefficient operation leads to a credible threat of losing one's business can the full efficiency potential be realised; if inefficient behaviour merely leads to stagnation, the effects are weak. In other words, competition only has its full effect if entry of new producers or suppliers into the market can occur against the will of the incumbents.

234. In the current system, such competitive entry cannot occur, due to the following barriers:

- MVM must agree. This allows "co-operative" entry through tendering rounds for new capacity, but no company can out-compete MVM.
- The Ministry of Economic Affairs and/or Parliament must agree.
- Power plant must be in the public interest.
- A customer must require the power.
- The Hungarian Energy Office must grant a license.

235. In the future system, entrants will theoretically be capable of out-competing MVM in the "authorised" market segment. However, obstacles still persist. The June version of the draft Electricity Bill clearly put competitive entrants at a disadvantage compared to MVM regarding rights of way and land use

for their equipment. But even though these provisions were dismantled, a competitive entrant must still obtain transmission services, and in all likelihood also emergency back-up and top-up services from MVM. Yet MVM still owns generation – not only the Paks nuclear plant and the Vértes coal plant, but also stakes in other power plants - as well as stakes in distribution and supply.

236. If a competitive entrant threatens to out-compete MVM, the latter has an incentive to discriminate against him (to protect its revenue from the threatened segments), it has the information it needs to discriminate against him (from its participation in all parts of the industry), and may well have the power to discriminate against him, using unfavourable access conditions in the grid, unfavourable or withheld backup deliveries, or by temporarily lowering prices in the threatened market segments. Moreover, since MVM is still at the centre of the non-competitive segment of the market, and responsible for long-term system planning, it may well expand capacity in the centralised segment beyond what is necessary, and use this excess capacity to ward off entrants.

237. In principle, this is the ideal moment to introduce competition: during the next 10 years, almost 30% of Hungary's installed capacity will be replaced. This would allow gradual phase-in of a large number of diverse new entrants – provided the new capacity is not contracted for by MVM in its totality. However, MVM continues to conclude long-term power purchase agreements. Unless these agreements are re-opened for negotiations after the introduction of competition, they will block competitive entry by sowing up all domestic supplies. Electricity trade cannot be counted on as an alternative supply source, unless the interconnections are reinforced, which requires the development of efficient transmission tariffs.

238. In light of the above discussion, it does not seem to be very likely that significant competition will develop in Hungary under the current proposal for a liberalised power market. Unless the areas in need of clarification are settled in a more pro-competitive manner, the Hungarian system will have become only marginally more competitive than it is at present. In many respects, the system as designed bears a resemblance to the new Portuguese power market, which came into effect in mid-1997. It comprises a centralised Single Buyer system that co-exists with an eligible market allowing third party access.

239. The Hungarian Government should review the current draft with a view to

- Clarify the areas that need more detailed attention as soon as possible,
- Eliminate all discriminatory provisions to ensure effective competition,

and it should:

- Provide for and announce an opportunity to re-negotiate existing long-term contracts after entry into force of the Bill. This will require devising a mechanism for stranded cost recovery, which is so far only hinted at and must be developed much more clearly.

Unless this is done, the amount of competition that develops in the system may well remain negligible. However, for a system with near to no competition, the proposed design appears oddly cumbersome: the formerly integrated system will have been separated vertically in a painful process, only to stop short of making use of its full benefits, and the disaggregation of services leaves Hungary with a record number of price elements to be regulated, at non-negligible administrative cost. The 1999 Electricity Bill, if it were to be adopted as is, would certainly represent a missed opportunity.

5. RECOMMENDATIONS

240. The Government of Hungary should:

1. Introduce effective competition into the electricity supply industry.

- Restructure the industry in such a way as to eliminate both the incentive and the possibility for MVM and the distribution and supply companies to discriminate against competitors in the wholesale and retail markets.

- Eliminate MVM's role as monopsonist buyer from generators and monopoly seller to distribution-supply companies by attributing the right to these companies to sell and buy directly.

- Establish a fully independent power exchange for economic transactions, accessible to all market participants.

- Create truly independent distribution system operators. If this prove insufficient to ensure the benefits of competition are passed on to ultimate consumers, separation of the distribution business and the retailing business might be considered.

- Abolish the long-term system planning function of MVM and its role in approving new power plants. MVM's current role in monitoring and forecasting demand might go to the regulator or Ministry.

- Introduce retail competition, using regulated network access rules. Significantly reduce MVM's shareholding in the distribution and retailing businesses. Extend the freedom to choose electricity suppliers to all users as soon as feasible. Establish a schedule for this extension.

- Eliminate all discriminatory provisions in the laws and regulations.

- Ensure that all potential competitors have equal access to primary energy inputs at cost-reflective prices.

- Ensure that long-term contracts do not delay the onset of or diminish effective competition.

2. Take steps to create an independent, transparent effective regulatory body and enhance antitrust surveillance:

- The essential regulatory responsibilities should be shifted from the Ministry of Economic Affairs to an independent regulator with transparent and accountable decisions. In particular, the Hungarian Energy Office should be responsible for regulating transmission and distribution tariffs and access conditions, licensing of new plants, and tariffs for final consumers.

- For matters remaining under the final responsibility of the Ministry, ensure that the Ministry consults the Hungarian Energy Office on all major policy issues and that all Ministry decisions are published with accompanying explanations.

- Strengthen the independence of the Hungarian Energy Office. Procedures for selecting and removing members should ensure that they may act without undue concern of short-term political pressures or allegiances. Ensure that the regulator can foster and participate fully in public discussions of energy policy.

- Strengthen competition law enforcement in the energy sector, particularly with respect to market access and anti-competitive conduct and mergers. The Hungarian Energy Office and the Competition Authority should consult regularly, particularly on changes in regulations that affect competition.

3. Take steps to make prices more cost-reflective.

- Take immediate steps to design non-discriminatory, cost-reflective and transparent transmission tariffs that will deal effectively with congestion and provide correct incentives for system expansion and, especially, for interconnection to neighbouring countries, where technically possible.

- Encourage the development of interruptible contracts, so that customers can choose their level of reliability.

NOTES

1. Észak-dunántúli Aramszolgáltató Rt., Northwest Hungary Electricity Supply Co.

2. Budapesti Elektromos Művek Rt., Budapest Electric Co.

3. Észak-magyarországi Aramszolgáltató Rt., Northern Hungary Electricity Supply Co.

4. Tiszántúli Aramszolgáltató Rt., Eastern Hungary Electricity Supply Co.

5. Dél-magyarországi Aramszolgáltató Rt., Southern Hungary Electricity Supply Co.

6. Dél-dunántúli Aramszolgáltató Rt., Southwest Hungary Electricity Supply Co.

7. The combination of generators and coal mines is described in detail in Section 2.1.1, Restructuring and Privatisation.

8. Important legal provisions for the establishment of the Hungarian Energy Office were also established earlier through the 1994 Natural Gas Act.

9. The Paks plant and the matter of nuclear energy in Hungary are treated in greater detail in chapter 8, Nuclear.

10. These issues are described in more detail in Section 1.4, Transmission, International Interconnection and Trade, below.

11. It is generally cheaper to transport the input energy and convert it into electricity closer to the demand centres than to transport electricity over long distances - provided the input is mobile. This is obviously not the case for hydro power, and some of the existing very high voltage power lines are consequently used to transport hydro electricity.

12. There are two distinct ways of transporting electricity over long distances: along alternating current (AC) lines, or along direct current (DC) lines. The average cost of DC transmission falls significantly with distance, which makes this method cheapest for moderate amounts of power transported over long distances (above 1 000 km). The average cost of AC transmission falls with the amount of power transported, but this decline is much steeper than the distance-related decline for DC. For this reason, even very long-distance power transmission is cheapest via AC lines, provided the amount of power carried is high enough. The 750 kV AC network linking the countries of Central and Eastern Europe and the Former Soviet Union was well-adapted to the power flows it supported: 1 000 to 2 000 MW transported over several thousand kilometres.

13. Synchronisation refers to power systems using alternating current (AC). All parts of such systems must run synchronously, i.e. the electrons in all interconnected AC wires must move backward and forward in lockstep. This issue does not arise for direct current (DC), as it only flows in one direction.

14. The only practicable way other than seeking support from international lenders such as the World Bank, or the European Bank for Reconstruction and Development (EBRD).

15. For an overview of the rights attached to “golden shares” in Hungary, see Box 2 in Section 2.1.3.2.

16. For more information on the rights attached to “golden shares”, please refer to Box 2 in Section 2.1.3.2.

17. Also, MVM considers that the share swap with SZÉSZEK caused it financial losses.

18. Főnix Kft. is one of a small number of new gas companies which are somewhat independent from the dominant gas supplier MOL.

19. These terms are used in the English translation of the draft Bill, although not referring to two separate markets but referring to the customers served in these markets. Later versions of the Bill also use the terms "franchise market" or "regulated market" to designate the same customers.

20. The terms "private" and "public" are not to be construed as meaning "privately-owned" or "publicly-owned". Instead, a "public" power generator sells his power into the general electricity market, whereas a "private" power generator produces for his own use or for sale to a limited number of customers.

21. In the following, the quotation marks will be dropped when referring to "utility", "authorised", "public" or "private", except for the expressions "utility" market and "authorised" market, as these expressions are not directly used in the draft Electricity Bill.

22. See Section 3.5.

23. GDP figures may be a misleading indicator for wealth in CEE countries, because there is a significant black economy. However, the following fact may illustrate the gap that still exists between the long-standing market economies and Hungary: in the 1995 heating season, 39% of households in Budapest spent 30% or more of their disposable income on heating, and 72% spent 20% or more, despite the fact that prices were then still heavily subsidised. Budapest is the region with the highest GDP in Hungary.

24. Whether large-scale competitive entry under the currently proposed framework is likely to occur in the long term will be discussed in the following sections.

25. Hungary has a much higher share of gas use in its Total Primary Energy Supply than any other OECD member country. A large part of this gas is imported from Russia, which causes significant concern about security of supply in Hungary. It is for this reason that during the 1997 tendering round for new capacity, the use of natural gas as input fuel was severely restricted, although CCGTs tend to be among the cheapest base load supply options available in the market.

26. To avoid confusion in the specific Hungarian context, it should be noted that "low" prices means prices just covering marginal cost, but not prices below marginal cost, which would correspond to the situation the Hungarian market has just struggled its way out of.

27. Hungary would be well-advised *not* to follow the German example in this respect. Germany did not develop transmission prices before market opening and is struggling to devise viable and efficient prices at present. It is already clear that the insufficiently developed, strongly distance-related pricing solutions used in the interim have severely hampered competition, among other things by constricting the economically viable market size far beneath optimal values.