Social and Environmental Impacts of Power Sector Reform in Hungary

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Introduction

In terms of energy use 3 main economic phases have been identified in the last 15-20 years:

- before 1990: phase of intensive energy use. +1% GDP growth required app. +0.5% energy use and more than +1% electricity use. Two key attributes need to be highlighted: the significant role of energy intensive industries and low, subsidised energy prices. The economy's capacity to produce value added was poor compared to Western countries.
- 1990-1993: in 1990 Hungary started the transition from central planning to a market economy. The partial loss of the Soviet export market and the introduction of market-based methods had dramatic consequences. One part of the Hungarian economy collapsed: it was primarily energy intensive sectors (iron-steel and aluminium industry, heavy chemical industry, mining etc.) that went bankrupt. Consequences: 15 % decline in GDP, 25 % reduction in primary energy use[1] between 1989-1993. During this period primary energy use fell by 300 PJ (from 1350 PJ to 1050 PJ)! (It is a high figure especially considering the fact that various energy conservation efforts lead to annual savings of maximum 8-10 PJ.)
- 1993-2001: economic recession (GDP) hit the bottom in 1993. After that the restructuring and modernisation of the economy started, putting it on the track to ever-faster development. As a result of privatisation and green field investments the spectacular development of non-energy intensive industries (automotive industry, electronics, telecommunications, precision engineering etc.) began. GDP has been growing at an ever-improving rate for the last 8 years. 3-5 % GDP growth required +0 % increase in energy use. Exports (especially in manufacturing) were mainly directed to the EU (70%) and significantly increasing. At the same time primary energy use was stabilised around 1050 PJ for the whole period.

Evolution of Energy Use

When the transition started, energy intensive industries represented a relatively large share. Prices were subsidised. Energy and environment awareness was low. Consequence: high energy intensity[2], approximately 3,5 times above the OECD average (Table 1).

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[1] Total energy use in Hungary, including the energy sector (energy transformations, energy supply and distribution etc.).

[2] Energy intensity = TPES / GDP (energy required to produce one unit of GDP).

Table 1: GDP and energy use in Hungary[3]

	France	Germany	Hungary	Austria	OECD average
Energy intensity (toe/1000 '90USD)	0,19	0,18	0,71	0,15	0,25
En.int. corr. by PPP[4] (toe/1000 '90USD)	0,22	0,23	0,35	0,19	0,26
Energy use/capita (toe/capita)	4,34	4,20	2,50	3,57	4,63
GDP / capita (1000 '90 USD/capita)	21,86	22,04	3,16	22,17	17,74

High intensity is due to several factors that are not primarily energy-related. The real problem lies in Hungary's poor capacity to produce GDP, which, among others, may be explained by the relatively high share of heavy industries generating little value added, the relatively low share of services, low employment, still existing distortions in pricing and the undervalued Hungarian forint. Correction by purchasing power partly eliminates this distortion yet energy intensity remains ~1,5 time higher than the OECD average. Energy consumption per capita, however, is below the EU and OECD average.

The energy dependency of the economy started easing well before the transition had taken place. The situation characterised by "1 % growth requires 1 % increase in energy use" has long been gone. This is also shown by the continuous decrease of the energy elasticity indicator.

Table 2: Evolution of energy elasticity[5]

Years	1970	1985	1993-2000
Elasticity, %/%	0,88	0,4	- 0,07

The change between 1993 and 2000 is particularly striking: since '93: 28 % GDP growth has been linked to a 2 % decrease in TPES i.e. the elasticity indicator was negative (-0,07.). In 2001 the cold winter increased the TPES by 29 PJ. **(Fig. 1)**

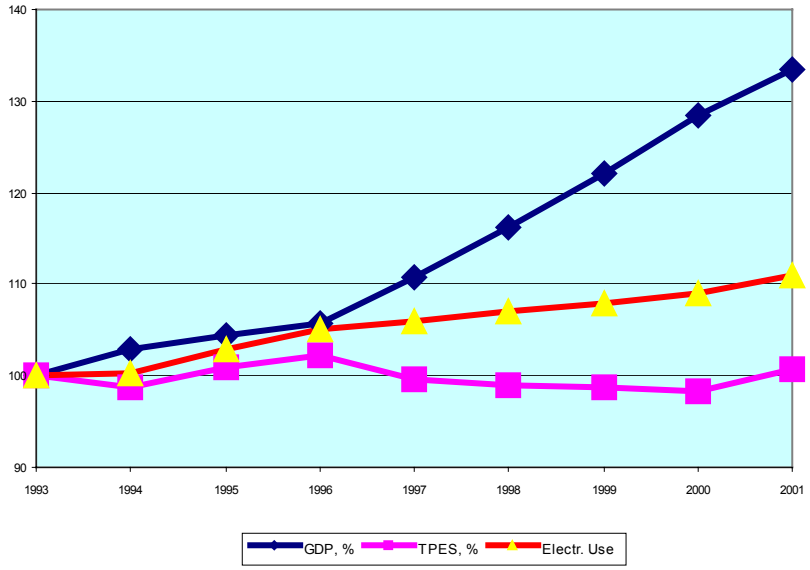
This shows that the **relationship between economic growth and energy use has fundamentally changed: the economy may grow while energy use is lessening**. This is partly due to industrial restructuring and partly to the fact that the energy consumption of numerous activities such as services and trade is not linked to the value added generated by the given sector.

[3] Source: OECD IEA: Key World Energy Statistics 1998

[4] PPP = purchasing power parity

[5] Energy elasticity indicator = how many % TPES growth goes together with 1 % GDP growth (ΔTPES / ΔGDP).

Fig.1. Evolution of GDP, TPES and Electricity Use in Hungary, %
(GDP: 3,6 %/year Electr.: 1,4 %/year)



Economic and Power Sector Reform Reform

A large-scale privatization programme started in the manufacturing sector in the first half of the nineties. Foreign investors – mainly such international giants as General Motors, General Electric, IBM, Sony, Nokia, Philips, Thompson, VW etc. - started to build up export oriented, low energy intensity branches.

Privatisation began in the energy sector early. The Competition Law and the 1994 Electricity and Gas Acts brought Hungary's energy market closer in line with EU directives. Since late 1995, when large stakes in the gas and electricity companies were sold off to foreign investors (e.g. RWE, Bayernwerk/E.ON, Gas de France, Electricité de France, Tractebel, Powergen, AES, Italgas, VEW-Ruhr etc.), Hungary can now claim that it has privatised its energy sector, and advanced down the road of private ownership and the free market. **(Fig. 2)**

Hungary's progress in the transition to a market economy has been considerable. According to Financial Times Energy Hungary's transition indicators are as follows:

Private sector share of GDP, mid-1998: 80 %.

Large-scale privatisation: more than 50 % of state-owned enterprise and farm assets in private ownership and significant progress on corporate governance of these enterprises.[6]

Small-scale privatisation: Standards and performance typical of advanced industrial economies: no state ownership of small enterprises; effective tradability of land.

[6] But taking into account the purchase power parity of the Hungarian currency, the different industry structure, the relatively low share of the services sectors and the low added value of the economy, the Hungarian energy intensity is not much higher than that of the EU average.

Governance & enterprise restructuring: significant and sustained actions to harden budget constraints and to promote corporate governance effectively (e.g. through privatisation combined with tight credit and subsidy policies and/or enforcement of bankruptcy legislation).

Price liberalisation: Substantial progress on price liberalisation: state procurement at non-market prices largely phased out.

Trade and foreign exchange system: Standards and performance norms of advanced industrial economies; removal of most tariff barriers; membership in WTO.

Fig. 2. State of the energy sector privatisation

- Power stations: All privatized except the nuclear and an old coal-fired power station
- Electricity distribution companies: all the six privatized
- Gas distribution companies: all the six privatized + there are 2-3 small new private companies
- Hungarian Oil and Gas Company: in 25 % state-owned, in 75 % private (5 % Hungarian small investors, 70 % Western banks)

The new owners: Western European and American strategic investors (e.g. RWE, E.on, EdF, Tractebel, Powergen, AES etc)

- Electricity distribution companies (based on sold electricity): E.on 35 %, RWE-EnBW 43 %, EdF 22 %.
- Generators (installed capacity): MVM (the Hungarian-owned nuclear PP) 30 %, Tractabel 28 %, AES 17 %, PowerGen 5 %, EdF 4 % (others 5 %)

With the privatisation, the “unbundling” has happened. Generators are independent, and there is a system operator (owned by the Ministry of economic Affaires). The transmission grid is owned by MVM. Equal and discrimanation-free access is garanteed for all players to the grid for tariffs.

Energy Prices and the Household Budget

In Hungary the CSO has regularly surveyed 10.000 households hence reliable data are available about the household budget. In 1998 energy costs represented 6.1 % in average in the household budget, 2 % more than 8 years before (gasoline and diesel excluded).

Table 3: Household spending by main groups of expenditure in ’90 and ’98

	1990	1998
Heating, household energy	4,1 %	6,1 %
Beverages, tobacco	12,1 %	8,4 %

But the CSO survey shows that there are big differences between incomes: the net income relation of the richest decile to the poorest one is 11:1. People belonging to the richest decile consume 3 times more energy than people coming from the poorest one. Simultaneously the survey also shows that the energy costs of the different heating systems and fuels widely vary. DH is the most expensive form of heating and according to experts' estimations the costs of a district-heated dwelling are twice as high than that of individual gas heating. The yearly DH costs of a small dwelling (around 55 m^2) are about the monthly average net income of an employee (ca $300). Hence the interesting result: going from the lowest towards the highest decile the share of the DH is increasing.

As a consequence of this situation households with multiplied disadvantages (lone, retired person or big family with many children and unemployed grown up persons, with DH) have to pay a considerable share of their income for energy (up to 30-40 % or more).

On the other hand households belonging to the upper deciles would very probably be able to pay "economic" energy prices.

Despite all the difficulties and problems

- non-payment of utility bills by both industry and households is not a relatively common phenomenon (non-payers can be disconnected from the electricity or gas network)
- billing of energy deliveries to end-consumers is based on metering for electricity and natural gas in almost 100 %
- around 50 % of households pay on so-called “flat rate” tariffs for DH but according to the recently approved DH Law (in '98) till 2003 all district heating bills have to be based on metering at a substation in each building. (The costs have to be distributed among the consumers in the house according to local agreement (e.g. m^3 basis)).

The impact of PSR (and energy prices) on the economy and energy efficiency

All economic sectors use energy. Electricity and gas are widely used, but changes in the prices of gasoline and diesel also have an impact through transport and shipping.

Let’s review how changing energy prices influence the economy. The evolution of such prices has an actual impact on two areas: the energy sector (energy production, supply, distribution) and energy intensive sectors (some of the heavy industries, chemical industries and transport).

- Distorted prices lead to a declining profit position in the **energy sector**, which then becomes incapable of carrying out the required development and maintenance. The best professionals are gone. Eventually, the efficiency of energy transformations may deteriorate as well.
- Subsidised energy prices send the wrong message to **energy intensive sectors**. Branches otherwise making losses or in regression start to expand, their exports grow (improved international competitiveness as a result of depressed prices). Other sectors, however, pay dear for the development of such branches e.g. the energy use of the country is going up, increasing energy imports damage the foreign trade balance, environment pollution increases.

- **Households** are also sensitive to changes in energy prices. According to data published by the Central Statistical Office the category of heating and household energy represents 6,1 % on average in the cost structure of households. Therefore we feel that the population's capacity to pay their energy bills should be treated in a differentiated way. Only the poorest 10-20, perhaps 30% of the population are actually impacted by energy prices. Consumers belonging to higher revenue categories would be capable of paying market prices.

On the other hand social sensitivity is justified as the share of the category of heating and household energy within household expenses grew by 2% between 1990-98 (6,1 % up from 4,1 %). At the same time the purchasing power of the population declined and has not still reached the level of 1989. It is also obvious that heating expenses sometimes do not correspond to the average and some families face the greatest difficulty in paying their energy bills.

- The competitiveness of other **non-energy intensive sectors** is not essentially influenced by energy prices. In the non-energy intensive sectors, energy costs represent only 3-8 % of all costs. But subsidised energy prices undoubtedly reduce the economic efficiency of energy conservation investments and so discourage energy efficiency investments.

Though the trends of the energy prices in gross and the economic price level are converging there are still many steps to make. Probably the liberalisation of the electricity and gas market in 2003 and finally the EU membership together with a growing standard of living will solve all the remaining problems of pricing.

Further social and environmental impacts of PSR

The electricity market will be opened for eligible consumers (over 6.5 GWh/year, representing max. 30 % of the consumption), from 1st January 2003.

While industrial prices are in line with EU prices, the household consumers' prices are below economic prices by 30-50 %, compared to EU. As long as Hungary is not a member of EU, HH consumers will be so-called public utility consumers and the HH energy prices will be regulated by the state. After Hungary's EU membership (or even before, for sustainable development), prices will very probably increase. Establishment of social schemes will be necessary for supporting people belonging to the poorest 2-3-4 deciles.

Long-term impacts of the electricity and gas liberalisation:

- on the supply side: high level of competition, import competiton, increasing efficiency (less energy is used, mitigation of emissions)
- on the demand side: (maybe for industries) cheaper prices (if!), less motivation for energy efficiency investments
- decreasing profit at the supply / distribution side: less motivation for building new power stations (security of supply and safety problems)
- for households: higher prices, more motivation to save energy, better pay-back times for energy efficiency investments, mitigation of emissions