Instruments and Options for Environmental Policy during the Accession Process of EU Associated Countries in the Area of Environment and Energy

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1 Introduction

More than four years ago the European Union (EU) decided to start negotiations with possible new member countries about accession. Czech Republic, Estonia, Hungary, Poland and Slovenia were the first countries which were accepted to perform the formal accession process. Accordingly these countries are called Accession Countries.

With regard to the leading role in climate protection policies and strategies of the EU in general as well as of individual countries like Germany it is important to consider the impact of the accession process on the EU climate policy. CO_2 emissions of the accession countries amount to at least about a fifth of the carbon dioxide emissions of all 15 EU countries. Accession countries' CO_2 emissions will not influence the EU commitments of the first commitment period from 2008 to 2012. However, it is important to draw early intention to the Accession Countries because they will be included in the European commitment in the second commitment period from 2013 ahead.

Taking this into account the German Environmental Protection Agency (Umweltbundesamt) commissioned a comprehensive study in order to analyse the options and capabilities of the five Accession Countries in the field of environment and energy. This study was carried out in co-operation of research institutes from Germany and research institutes from the five Accession Countries. The study included the analysis of the most important issues as stated below:

- Status quo and development of the energy sector and structural CO_2 mitigation options;
- Legal gap assessment and analysis of the performance in the accession process;
- Identification of implementation patterns through a detailed policy analysis;
- Evaluation of co-operation projects in the field of environment and energy in order develop conclusions for new projects which can promote the accession process.

This volume includes the comparative analysis with regard to the above mentioned topics that has been conducted by the German team. The detailed analysis of each Accession Country which has been carried out by the co-operation partners in the individual countries are documented in five country profiles, each as separate volume.

In the first step of the study, the developments in the Polish, Hungarian, Czech, Estonian and Slovenian energy sector have been assessed along with the general socio-economic, environmental and climate-policy developments in those countries since 1990 (section 2). As a result of this analyses, priority areas for environmental and climate policy have been identified.

The study then summarises systematically the composition of the energy- and environment-related "acquis communautaire," i.e. the relevant EU legislation (Regulations, Directives, and Decisions) and strategies in the field of environment and energy (section

3). This compilation does not only list the regulations but also relevant political objectives and strategies of the European Commission.

The third step of the study consists of assessing in how far the environmental provisions relevant for accession are already implemented, have been introduced in the legislative process or are planned in the mentioned countries. This legal gap assessment was done in close co-operation with project partners in the Accession Countries (section 4). The legal gap analysis to be prepared by these project partners has been complemented by existing country analyses conducted, inter alia, by European Institutions. As a result of this step, it has been analysed to what extent the existing legal gaps might be filled by the accession countries at the prospective date of accession.

Stage four of the study deals with the progress made concerning the implementation of the relevant regulations (section 5). The general patterns of environmental and energy policies in the respective countries has been examined. This analysis embraces the policy style, instruments used and the budgetary and institutional context. In a comparison of the political and economic frameworks of the Accession Countries with the ones existing in EU Member States, it has been revealed to what extent these conditions need to be adapted further.

The study has, in step five, elaborated a representative list of existing projects of bilateral or multilateral co-operation in the field of environment and energy. The analysis of theses projects focuses mainly on transferring "best practice" and identification of criteria for the development of new co-operation projects (section 6).

Finally, conclusions have been drawn on the existing deficiencies and recommendation have been elaborated on future action for the accession states (section 7). This has again been done in close co-operation with the project partners in the Accession Countries.

2 Status Quo in the Sphere of Environment and energy

Starting point for the evaluation and assessment of the accession process of each Accession Country is a detailed analysis of their development with regard to environment and energy since 1990. This analysis is based on both, socio-economic as well as energy and environmental data from international sources (OECD, EU, UNFCCC etc.). Additional data has been provided by the co-operation partners in each Accession Country.

In section 2.1 to 2.5 each Accession Country is assessed separately. A comparative analysis, which includes all Accession Countries as well as EU and German developments in the field of environment and energy is stated in section 2.6. As a result of this analyses, priority areas for environmental and climate policy have been identified in section 2.7.

2.1 Czech Republic

2.1.1 Demographic and Economic Trends

The Czech Republic has about 10 million habitants. The total population has been rather stable during the nineties. However, the population between 15 an 64 (economic active population) increased by 3% (World Bank 1999) which gave an extra thread to the already increasing unemployment rate (7.5% in 1998, MOP 1999, p. 265). Employment in agriculture was cut by half between 1990 and 1997 and by one fourth in industry. Merely employment in services increased slightly by 20%.

The number of apartments increased by about 2% which caused a decline in the average occupancy form 2.8 to 2.7 persons per apartment. The average size of an apartment was 71 m² in 1991. Although detailed assessments on the average apartment are not available for recent years, it is very likely that the average size increase slightly too.

With start of the transition the economy made a sharp decline. Real Gross Domestic Product (GDP) decreased between 1990 and 1992/93 by 20%. Since then the economy increased again and has reached 92% of its 1990 levels in 1997 (World Bank 1999).

2.1.2 Primary Energy Supply

Total Primary Energy Supply (TPES) decreased from 47 mtoe (million tones of oil equivalent) by nearly 25% between 1990 and 1991. In 1992 it increased again to about 40 mtoe and remains on this level until 1997.

2.1.2.1 Development of the Primary Energy Structure

The primary energy supply was dominated by solid fuels, i.e. coal. But the share of coal decreased steadily from 62% in 1990 by 10 percentage points to 52% in 1997. The

share of all other fuels increased slightly by about 2% (oil: from 18 to 20%, others, which is mainly uranium form 8 to 10%) except of gas. The share of natural gas increased form 11% in 1990 to 18% in 1997 (DG XVII 1998).

In absolute terms the picture is as follows: The consumption of solid fuels decreased from nearly 30 mtoe by 28% to 21 mtoe in 1997. The consumption of oil and other fuels decreased slightly in the first years of that period but enlarged again after 1993 and is in 1997 only slightly below (oil) or above (other fuels) the 1990 levels. Merely the demand for natural gas increased constantly during that period and is in 1997 more than 40% above the demand in 1990.

2.1.2.2 Energy Imports and Exports

The Czech Republic is a net exporter of coal (solid fuels) and imports nearly all of its domestic oil and natural gas demand. Some of the decline in domestic coal demand was compensated through increased coal exports. In 1990 17% of the domestic production was exported. This figure increased to about 23% in the following year an remained on that level until today. In absolute terms the exports of solid fuels increased from 5.9 mtoe in 1990 by 20% until 1992 to 7 mtoe. Hereafter they decreased slightly but are in 1997 still 3% higher than in 1990.

Nearly all domestic demand of oil and natural gas is covered by energy imports. National production of this fuels is marginal. Therefore the increased share of natural gas resulted in a visible increase in natural gas imports by more than a half.

2.1.2.3 Primary Energy Consumption per Capita

The primary energy consumption per capita was about 4.6 toe in 1990. In the following year it dropped sharply by 22% and increased again to 4 toe per capita in 1992 (87% of 1990 level). Hereafter it remained more or less constantly on that level. Compared to the average EU level the Czech primary energy consumption per capita was 20% above EU average in 1990 but dropped sharply to the EU average in 1991 where it remained constantly until 1996.

2.1.2.4 Primary Energy Supply per GDP

The energy intensity of the Czech economy did not follow a clear trend. In 1990 about 0.4 kg oil equivalent were used to produce one $US\$_{1995}$ of GDP (calculated with Purchasing Power Parities). Compared with the EU the Czech energy intensity is during 1990 and 1996 constantly about twice as high as the EU average. The development of that indicator did not follow a clear trend. The intensity decreased in 1991 and increased again to 108% of the 1990 level in 1992. Hereafter the energy intensity showed a constantly decline to 96% of the 1990 level in 1996.

2.1.3 Final Energy Consumption

Total final energy consumption dropped sharply by a fourth between 1990 and 1991 but remained more or less stable on the level after this year. This was mainly due to the decline in demand for solid fuels which decreased until 1996 to a third of its 1990 level. Opposite to that the demand for heat increased by the factor 2.5 between 1990 and 1996. The demand for natural gas increased by – compared to heat – merely 40%. Oil and electricity consumption decreased in the first years of that period but increased hereafter again nearly to the 1990 level (electricity 104%, oil 95%).

Due to theses developments the share of solid fuels decreased from more than 50% to nearly 20% in 1996. The share of both, gas and heat increased by 11 percentage point to 23% respectively 15% in 1996.

Half of the total energy consumption is consumed in the industry sector. Despite the down and upturn in the Czech economy this share did nearly not change during the nineties. Opposite to that the share of the transport sector increased from 9 to 15% whereas the energy consumption in the commercial and the residential sector declined from 42% in 1990 to 35% in 1996.

In absolute terms the consumption declined from 33.6 mtoe in 1990 by 25% to 25 mtoe in 1991. After this it remained more or less on that level. The development of energy consumption in industry was quite parallel to the development of total final consumption. More than 14 mtoe of final energy have been 1990 consumed in the commercial and residential sector. However, the consumption dropped by about 35% to about 9 mtoe in 1996. Compared to that final energy consumption of the transport sector seems to be of minor relevance. But opposite to the overall trend final consumption increased by a quarter from 3 mtoe in 1990 to nearly 4 mtoe in 1996.

2.1.4 Electricity Generation

Gross electricity generation decreased only slightly between 1990 and 1994 by 7% but increased again hereafter so that it is 1996 slightly above the level of 1990. More the three quarters (77%) of the electricity is generated in thermal power plants which were exclusively fired by coal. But since 1995 started electricity generation by natural gas although the share of natural gas for electricity generation is still below 5%. A quarter of the electricity is generated in combined head and power plants (CHP plants). The share of CHP is slightly increasing and achieves nearly 30% in 1996.

About a fifth (20 - 22%) of gross electricity generation comes from nuclear power plants. The share of hydro and wind was only 2.3% in 1990 but increased after all to 3.1% in 1996 (+35%).

The electricity imports and exports of Czech Republic are nearly balanced although there is substantial electricity trade with its neighbours. During the nineties it imported between 4 and 8 TWh from Poland and in some years between 1 and 2 TWh from Slovakia. Electricity exports went also to Poland and Slovakia. Additionally there were

electricity exports to Germany and Austria between 1 and 3 TWh. Compared to gross domestic generation the electricity trade balance is below 1%. Compared to electricity consumption it is mostly around 1%, except of the period between 1992 and 1993 where net electricity exports increased to nearly 7% of domestic electricity consumption.

2.1.5 District heating

At the beginning of the nineties more than 1.5 million households were connected to district heating systems. Until 1995 the number of households declined by 50,000 but increased again hereafter. It is projected that it exceeds the 1990 level by the year 2000. The total length of the district heating system is above 4,000 km with slightly increases in the second half of the nineties although installed grid capacity went back from more than 22,000 to less than 20,000 MW in the same period. Distribution losses went down from nearly 14% in 1990 to less than 12% in 1998.

2.1.6 Energy Markets

2.1.6.1 Electricity

The largest electric energy producer is the company ČEZ, jsc., with the total capacitance of approximately 11000 MW of installed capacity. In 1997 ČEZ's production represented 48,008 GWh which is nearly three quarters (74.3%) of the gross electricity generation in Czech Republic.

ČEZ jsc. sells most of the electricity it generates to the country's eight regional electricity distribution companies, which in turn distribute electricity to end-users. It also supplies electricity directly to a few large industrial facilities.

Electricity sales to regional distribution companies in 1998 differed considerably from company to company. The largest distributors according the purchased electricity in 1998 are:

- Severomoravska Energetika, jsc. 8,099 GWh
- Jihomoravska Energetika, jsc 7,603 GWh
- Stredoceska Energeticka, jsc. 6,302 GWh

2.1.6.2 Natural Gas

The company Transgas operates natural gas transit pipelines through Czech Republic and supplies natural gas to regional gas distribution companies. Eight regional gas companies, responsible for gas distribution, supply natural gas to other consumers.

Gas industry of the Czech energy sector has undergone development over the past years. Natural gas in that time has become a synonym for environmental improvements. Natural gas purchase of 9,343 billion cubic meters in 1998 was done under contracts of Rus-

sian natural gas – from Gazexport (Russia) and Wintershall (Germany), and under those for natural gas imports from Norwegian producers Statoil, Norsk Hydro, Saga Petroleum and Total Norge. Small quantity was delivered from Czech resource – MND Hodonin. During last five years consumption grew with 31%.

Three biggest distributors are:

- South Moravian Gas, jsc.
- North Moravian Gas, jsc.
- Prague Gas, jsc.

The network of high-pressures and very high – pressure pipelines was developed mainly within the framework of natural gas subsystem. In the town gas subsystem the pipeline was build also and afterwards it was conditional for the transition of town gas consumers to natural gas. Total length of transmission pipelines increased since 1994 from 24,000 to 33,500 km, which is an increase of about 40% within four years. Parallel to the number of consumers increase too although not in the same pace (+13%).

2.1.6.3 Heat

Heat generation from central sources is utilised in large scale in the Czech Republic. Greatest part of heat is generated in combined head and electricity systems in large-scale plants. Complete majority of heat plants was privatised and in the current time have owners, in many cases, foreign owners.

The largest heat suppliers according the share of heat supply in its category (power and heat plants, including industrial plants) are:

- Moravskoslezske teplarny, jsc. supplies five important towns of the region North Morava: Ostrava, Olomouc, Přerov, Krnov and Frýdek-Místek. 54 boilers produce heat and electricity. Total grid length is 470 km and the heat power capacity is 2267 MW.
- Prazska teplarenska, jsc. supplies to the city Praha and surrounding area. A lot of work was done on changing fuel – brown coal to gas. Another investment has been put into the heat pipe connection Power station Mělník II to Prague and heat distribution to heat exchangers.
- ČEZ, jsc. produces heat as a part of production of electricity. Turnover of heat is nearly 4 up to 5 % from the whole production.

The company ČEZ, jsc, is operating great capacity sources, mainly combined heat and electricity generating plants. From this plants are feeding piping and primary distribution lines for steam and hot water to exchangers. The exchanger stations are operated usually by customers, secondary distribution lines mainly by the proprietors of the heated facilities.

Industrial producers, consuming themselves the major part of the generated heat and selling only a small part to housing authorities and to other clients gradually decrease this production related to changes in ownership. According to transformation process, the delimitation of some plants outside ČEZ Company came into effect. There are a large number of heating sources, which are public or in town's ownership also.

2.1.6.4 Development of Prices

Trends in energy prices are very heterogeneous. However, there are some remarkable patterns that could be identified. In general prices in real terms for electricity, fuel oil and natural gas increased substantially between 1990 and 1997 whereas the price for (district) heat decreased slightly.

Real electricity prices for industry, measured in CZK increased by a factor of 5.8 between 1990 and 1991 but came down again after 1992 to about 390% of 1990 levels in 1997. The increase for residential use of electricity reached it's peak in 1992 (340% of 1990 levels) and declined hereafter to about 270% of the 1990 levels.

The pattern for natural gas is somewhat similar. First a sharp increase, then a constantly decline but still well above the 1990 levels (430% for residential use, 330% for industry).

The development of fuel oil prices is rather different. For residential uses it decreased first by 50% (1992) and increased hereafter to 230% of 1990 level in 1997. The price for fuel oil in industry first increased to 280% of the 1990 level but decreased hereafter until 1994 (180% of 1990 level) when it started to increase again up to 390% of the 1990 level in 1996.

Opposite to that the price of heat decreased, both, for residential uses as well as for industrial purposes. For the residential sector it decreased by nearly 50% between 1990 and 1994 but increased again to 70% of the 1990 level in 1997. The heat price for industry decreased by 45% between 1991 and 1996.

In general energy prices increase sharply between 1990 and 1991/92 (due to economic decline and liberalisation strategies and decreased slightly after this but remain still substantially above 1990 level.

2.1.7 Energy and the Environment

2.1.7.1 Greenhouse Gas Emissions

Greenhouse gas emissions (three gas basket) went down between 1990 and 1994 from about 190 to nearly 147 million tons of greenhouse gas equivalent (GHGE). This corresponds to a decline by 22%. Since 1995 GHG emissions started to increase again to about 158 million t GHGE in 1997, which is still 17% below the 1990 levels. Almost

nine tenth (88%) of these GHG emissions derive from fuel combustion although this share is decreasing slightly to 86% in recent years.

With regard to the individual greenhouse gases the development is as follows: 88% of the GHG emissions are CO_2 emissions. The share of Methane (CH_4) decreased between 1990 to 1997 from 9 to 7% whereas the share of N_2O increased from 4 to 6%.

More than 18 t GHGE have been emitted per capita in 1990. This was 60% above the EU average (11.5 t GHGE/Cap.). Parallel to the absolute emissions the per capita emissions decreased sharply until 1994 but increased again afterwards. However, in 1996 they are still 16% below the level of 1990 and only 30% above the EU average which decreased only by 6%.

The carbon intensity – calculated by the ratio of overall GHG emissions to GDP at 1995 real PPP – had a quite different development. Due to the economic decline it rose between 1990 and 1991 (+8%) but went then down until 1996 (1.4 kg/US$). With increased pace of the economy it started again to grow to 1.5 kg/US$ in 1997 which is still 9% below the figure of 1990. However, the carbon intensity of the Czech economy was in 1990 2.5 fold higher than the EU average. As the carbon intensity in the EU decreased slightly faster than in the Czech Republic the Czech carbon intensity is still much higher than the EU average.

All airborne emissions declined sharply. SO_2 emissions dropped to a third of its 1990 level, NO_x emissions where nearly cut by half and VOC emissions declined by 18%.

2.1.7.2 Driving forces

The following figure shows five key factors (forces) that influence the development of CO_2 emissions which are

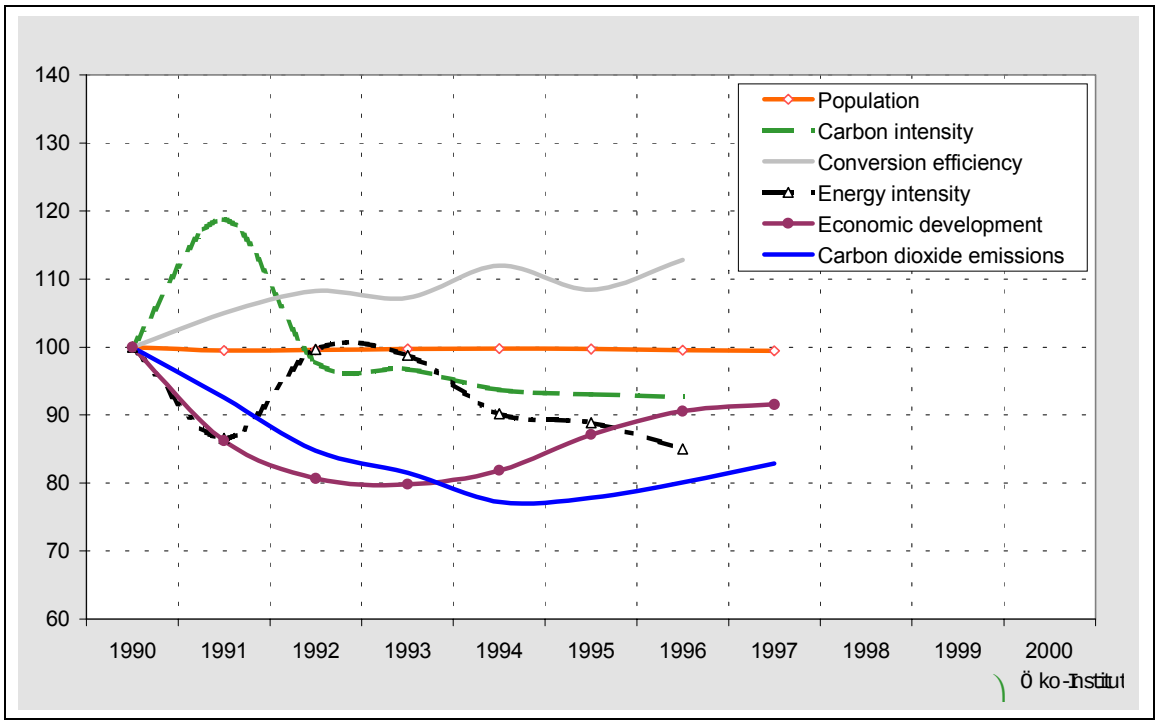
- population growth;
- carbon intensity: it is measured by ratio of CO_2 emissions to total primary energy supply and indicates whether the primary energy structure has developed towards less carbon intensive fuels or not;
- conversion efficiency: it is calculated as total primary energy supply divided by final consumption; it shows how the efficiency of energy conversion, in particular electricity generation has developed;
- energy intensity: it is calculated as the division of total final consumption by GDP at constant 1995 purchasing power parities; it show how much energy was used to produce one unit of domestic production;
- economic development: it is represented by the per capita GDP at constant 1995 purchasing power parities.

Together all theses factors could be use to decompose the development CO_2 emissions according to the following formula:

$$CO_2 = POP \cdot \frac{CO_2}{TPES} \cdot \frac{TPES}{TFC} \cdot \frac{TFC}{GDP} \cdot \frac{GDP}{POP} \text{ with}$$

CO_2 *CO_2 emissions*
POP *Population*
TPES *Total Primary Energy Supply*
TFC *Total Final Consumption*
GDP *Gross Domestic Product at constant 1995 purchasing power parities*
(OECD 1999, p 29).

Figure 1: Driving Forces of Czech Republic's CO_2 emissions



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Obviously population growth did not influence the development of CO_2 emissions in Czech Republic. Opposite to that the economic development did have an substantial impact. The economic decline between 1990 and 1992/93 was mainly responsible for the decline of CO_2 emissions of Czech Republic. The energy intensity showed an unstable development. It first went down but increased again and decreased constantly after 1993. In particular the improvement after 1993 was responsible for the only slightly increase of CO_2 emissions although the economy started to grow again substantially. This was also supported by the improving carbon intensity which decreased slightly

after 1993. In contrast to that the conversion efficiency decreased[1] by about 10% during the nineties which compensated some of the positive effects in energy and carbon intensity. Thus, efforts to improve the conversion efficiency should play a key part in a Czech strategy for greenhouse gas mitigation.

2.2 Estonia

2.2.1 Demographic and Economic Trends

Estonia has about 1.5 million habitants. The total population was slightly decreasing during the nineties (-8%). The economic active population between 15 an 64 decreased even more between 1990 and 1998 (more than 15%, World Bank 1999). Unemployment rates close to the EU average may be one of the major individual reasons to look for work outside of the country (10.5 to 10.0% between 1996 and 1998, MOP 1999, p. 85).

The number of apartments and the average size did not change between 1995 and 1998. However, the decline in population caused a reduction in the average occupancy by 4%. In 1998 each apartment was in average used by 2.3 persons. The average size of these apartments was 53 m².

With start of the transition the economy made a sharp decline. Real Gross Domestic Product (GDP) decreased between 1990 and 1993/94 by 35%. Since then the economy increased again and has reached about 80% of its 1990 levels in 1997 (World Bank 1999).

2.2.2 Primary Energy Supply

Total Primary Energy Supply (TPES) decreased from 10.4 mtoe (million tones of oil equivalent) by about 50% between 1990 and 1993. Since then it remained on the level until 1997 (between 5.2 and 5.7 mtoe).

2.2.2.1 Development of the Primary Energy Structure

The primary energy supply was dominated by solid fuels, mainly oil shale. The consumption of solid fuels decreased in absolute terms by 35%. However, its share increased due to the sharper decline of other fuels from less than two thirds to about three quarters.

Oil consumption decreased from more the 3 mtoe in 1990 to merely 0.3 mtoe in 1997. Corresponding to this the share of oil decreased from 30% in 1990 to 3% in 1997.

[1] Due to the definition of the conversion efficiency as TPES/TFC the indicator increases if the efficiency declines which corresponds to a increasing line.

In absolute terms the consumption of gas decrease by 50% from 1.3 in 1990 to 0.6 mtoe in 1997. However, as this is in line with the overall decline, the share of gas remained more or less constant at about 11% (DG XVII 1998).

2.2.2.2 Energy Imports and Exports

Estonia is a net importer of energy. During the nineties about 40% of its domestic energy demand is imported. Parallel to the decline in total primary fuel supply the imports decreased from 4.6 to 2.3 mtoe between 1990 and 1996. Nearly all domestic demand of oil and natural gas is covered by energy imports. Due to the decline in domestic oil an gas demand imports of these fuels decreased correspondingly.

Imports of solid fuels decreased from 0.8 to 0.5 mtoe. This is about 30% less in 1996 than in 1990. However, compared to the decrease of other fuels the decline in fossil fuels was moderate.

2.2.2.3 Primary Energy Consumption per Capita

The primary energy consumption per capita was about 6.6 toe in 1990. Until 1993 it dropped substantially by nearly 45% to 3.7 mtoe per capita and remained more or less on that level until 1997. The Estonian primary energy consumption per capita was 80% above EU average in 1990 but dropped remarkable to the EU average until 1993 where it remained steadily until 1996.

2.2.2.4 Primary Energy Supply per GDP

The energy intensity of the Estonian economy did not follow a clear trend. In 1990 more than 1 kg oil equivalent were used to produce one $US\$_{1995}$ of GDP (calculated with Purchasing Power Parities). The energy intensity decreased by nearly one third to about 0.7 kg oil equivalent per US$.

Compared with the average EU energy intensity the Estonian energy intensity exceeded the European average by more than factor 5 in 1990. Despite the decrease in energy intensity it is still substantially above the European average in 1996 (0.19 kg/US$).

2.2.3 Final Energy Consumption

Total final energy consumption dropped sharply by 60 between 1990 and 1993 but remained more or less on that level in subsequent years. Solid fuels showed the sharpest decline. In 1993 final consumption of solid fuels was only 15% of its 1990 level. However, demand for solid fuels increase again and was less than 20% below the 1990 level in 1997.

In 1990 the share of oil was above 40%. The oil consumption was reduced substantially until 1993 form 2.6 to 0.7 mtoe. Correspondingly the share of oil dropped to 27% in 1997. In contrast to oil the share of heat remained more or less on its 1990 level. How-

ever, parallel to the decrease in overall final demand head demand fell by more than 50% from 2 mtoe in 1990 to less than 1 mtoe in 1997. Gas is of minor relevance. Its share is below 5% during the nineties with a slightly decreasing trend.

Electricity consumption decreased from 0.6 to 0.4 mtoe between 1990 and 1996. This is equivalent to a decline in demand by about 30%. As electricity demand fell less than the overall final demand its share increased from 9 to 15%.

In 1990 30% of overall final energy consumption was induced by industry. The share of the transport sector was merely 10%. The rest of final energy demand was induced by the residential and commercial sector. The share of this sector (60%) remained on that level until 1997 whereas there was a shift from industry to transport. The share of industry decreased to 27% whereas the share of the transport sector increased to 13%.

2.2.4 Electricity Generation

Gross electricity generation decreased from more than 17 TWh in 1990 to about 9 TWh in 1993. Electricity generation dropped in that period nearly by 50% but remained on that level subsequently. Net electricity exports decreased from 3.2 TWh in 1992 to about 1 TWh in 1997.

Installed generation capacity amounts to 3.4 GW. All electricity is generated in thermal power plants. Since 1993 all electricity generated domestically comes from CHP plants.

The share of solid fuels (oil shale) in electricity generation increased from 85% in 1990 to more than 95% in 1997. Electricity generation from oil or gas hat only minor relevance in Estonia (each below 2%).

2.2.5 District heating

Detailed information on district heating and its development (connected households, capacity, transmission losses etc.) is not available. However, about a third of final energy demand is covered by heat from district heating and nearly all thermal power plants are CHP plants. These two facts show already, that the application and development district heating is an important element of the Estonian energy sector.

2.2.6 Energy Markets

2.2.6.1 Electricity Market

2.2.6.1.1 Electricity generation

In Estonian Energy Act § 27 is said: *The state shall maintain at least 51% ownership of the share capital of commercial undertakings which are founded on the basis of power stations entered on the list of commercial undertakings that are of strategic importance to the state.*

Large thermal power plants are owned and operated by AS Eesti Energia (Estonian Energy). Eesti Energia consist of the sister companies (power generation, network, energy sales etc.). Eesti Energia is a stock company which is owned 100 % by the state. Currently AS Eesti Energia is an entity whose subsidiaries include business active in electricity production, transmission, and distribution. Privatisation, projected for the year 2000, was approved by the Government in 1998. According to the AS Eesti Energia's privatisation plan, it is foreseen that 49 % of state owned shares will be sold to a strategic investor, leaving 51 % remaining with Eesti Energia. In the future, in 2000, it is planned to sell the State owned shares in a public offering. Increasing the capital assets is also a possibility. The Government proposed as a novel idea the merger of oil shale mining ventures with the oil shale chemistry ventures of AS Eesti Energia. The Privatisation Agency will participate in the privatisation of AS Eesti Energia according to the plans approved by the Government of the Republic.

Table 1: Installed Generating Capacity of the most important power plants

Power plants	Electricity	Heat	Fuel	Commissioned in years
	- MW -			
Eesti PP	1,610	84	oil shale	1969-73
Balti PP	1,390	690	oil shale	1959-65
Iru CHP	190	825	Gas/heavy oil	1980-82
Kohtla-Järve CHP	39	534	Oil shale/heavy oil	1948-58
Ahtme CHP	20	335	Oil shale	1951-53
Diesel plants	8	0	Diesel oil	
Total	**3,257**	**2,468**		

Municipal co-generation plants in Kohtla-Järve and Ahtme (Table 1) with thermal energy distribution and transmission networks are operated by the stock company AS Kohtla-Järve Soojus and owned by AS Eesti Energia (59,2 %) and the City of Kohtla-Järve (40,8 %). The Company provides thermal energy to the Järve and Ahtme urban districts of Kohtla-Järve and Jõhvi as well as to the rural municipalities of Jõhvi and Kohtla.

Industrial power plants/cogeneration plants cover about 2 % of the total electricity generation capacity (More than 98 % of electricity is produced in four oil shale power plants).

2.2.6.1.2 Electricity transmission and distribution

The electricity transmission and distribution grid is operated by Eesti Energia and its sister companies, AS Narva Elektrivõrk (Narva Energy Network) and AS Läänemaa Elektrivõrk (Western Energy Network).

AS Narva Elektrivõrk is a stock company which is owned (49 % as of 09.11.98) by Startekor Investeeringute OÜ (51 % state owned). The privatisation of the company is on the way. In the Privatisation Program of State Property for 1999 the privatisation of 51 % of the shares of AS Narva Elektrivõrk is planned through an 18 % share offering to other shareholders. According to Article 2 section 4 of the Privatisation Law, the price will be established by the Board of the Privatisation Agency. The Board of the Privatisation Agency shall also determine the privatisation methodology of the remaining 33 % of the shares.

AS Läänemaa Elektrivõrk (Western Energy Network) is a stock company which is 100 % owned (as of 04.11.98) by AS IVO Energia stock company. The privatisation of the company has been completed.

2.2.6.2 District heating market

The stock company Tallinna Soojus (Stock Corporation Tallinn District Heating) is solely owned by the City of Tallinn. Tallinna Soojus has one subsidiary, AS Estterm and one affiliated company, OÜ Termest.

The Tallinn district heating grids are owned by the stock company AS Tallinna Soojus, the company meets approx. 71 % of the thermal energy demand of City of Tallinn. City of Tallinn has started the privatisation of the company.

Other heating plants (different from those mentioned in 2.2.6.1.1) are owned by the municipal utilities/other companies. Most of Estonian cities have heating plants owned by municipality or stock companies. In general the same companies own district heating grids in the area.

2.2.6.3 Gas market

Gas production is operated by a AS Eesti Gaas (Estonian Gas). Eesti Gaas is a stock company owned by Russia's OAO Gazprom (30,64 %), German's Ruhrgas AG (32,04 %) – two of the largest gas companies in Europe –, Neste OY (10,01 %), the state of Estonia and small shareholders comprising private and legal persons. The share capital of Eesti Gaas amounts to EEK 155.2 million.

The customers of AS Eesti Gaas and its subsidiaries include 147,237 residential clients, 526 commercial and public institutions, 158 industrial consumers, 61 district heat generators and 3 heat and power co-generators.

Gas imports and exports as well as the gas transmissions grid are managed and operated by AS Eesti Gaas. The distribution grid are managed and operated by its sister companies.

2.2.6.4 Mineral oil and coal market

Oil shale production is operated by AS Eesti Põlevkivi (Estonian Oil Shale Company). Eesti Põlevkivi is a stock company which is 100 % state owned. The privatisation of the company has not yet started. The Privatisation Agency will participate in the privatisation of AS Eesti Põlevkivi according to the plans approved by the Government of the Republic.

Mineral oil production (in Estonia oil shale liquefaction) is operated by Galoter in Balti Power Plant and Viru Keemia Grupp (former AS Kiviter) located in the north-eastern part of Estonia, Ida-Virumaa county.

There were two crude shale oil production technologies. The Galoter processing technology installed at the Eesti Power Plant uses the same oil shale (crushed) as the power plant (heating value around 8.6 MJ/kg). The Kiviter processing technology uses higher quality enriched (coarse) oil shale with a heating value of around 12 MJ/kg. In March 1999, the liquefaction stock company Kiviter was bankrupted due to low world market price of crude oil.

2.2.6.5 Development of Prices

Trends in energy prices are very heterogeneous. However, there are some patterns that could be identified. In general current prices, measured in EEK, for electricity and heat increased between 1993 and 1997. Opposite to that prices for oil an gas did not change substantially.

Electricity prices for private households showed the sharpest increase. In nominal terms (current EEK) the electricity price increased by about 300% between 1993 and 1997. However, in real terms it the increase amounts to merely 60%. Electricity prices increased by 100% in nominal terms. In real terms the electricity price for industry was nearly same as in 1993.

Heat prices for the residential sector did increase only slightly in nominal terms. Between 1993 and 1997 they increased by 70%. This corresponds to a decline in heat prices in real terms of nearly 30%.

Prices for oil and gas did not change much in real terms, both, for industry and for the private households. In real terms oil and gas dropped by half between 1993 and 1997. However, development of oil and gas prices is of minor relevance in Estonia because their share of overall fuel demand is quite low.

2.2.7 Energy and the Environment

2.2.7.1 Greenhouse Gas Emissions

Greenhouse gas emissions (three gas basket) went down between 1990 and 1993 from about 40 to nearly than 24 million tons of greenhouse gas equivalent (GHGE). This corresponds to a decline by 40%. Subsequently GHG emissions remained on the level achieved in 1993. More than nine tenth (92%) of these GHG emissions derive from fuel combustion although this share is decreasing slightly to 89% in recent years.

With regard to the individual greenhouse gases the development is as follows: more than 90% of the GHG emissions are CO_2 emissions. The share of Methane (CH_4) increased between 1990 to 1997 from 5 to 9% whereas the share of N_2O somewhat around 2%.

Nearly 26 t GHGE have been emitted capita in 1990. This was more than the double of the EU average (11,5 t GHGE/Cap.). Parallel to the absolute emissions the per capita emissions decreased sharply until 1993 by about 40% and persist on this level. However, in 1996 they are still 45% above the EU average which decreased only by 6%.

The carbon intensity – calculated by the ratio of overall GHG emissions to GDP at 1995 real PPP – showed a quite different development. It did not decline until 1992. Hereafter it declined by merely 30% until 1997.

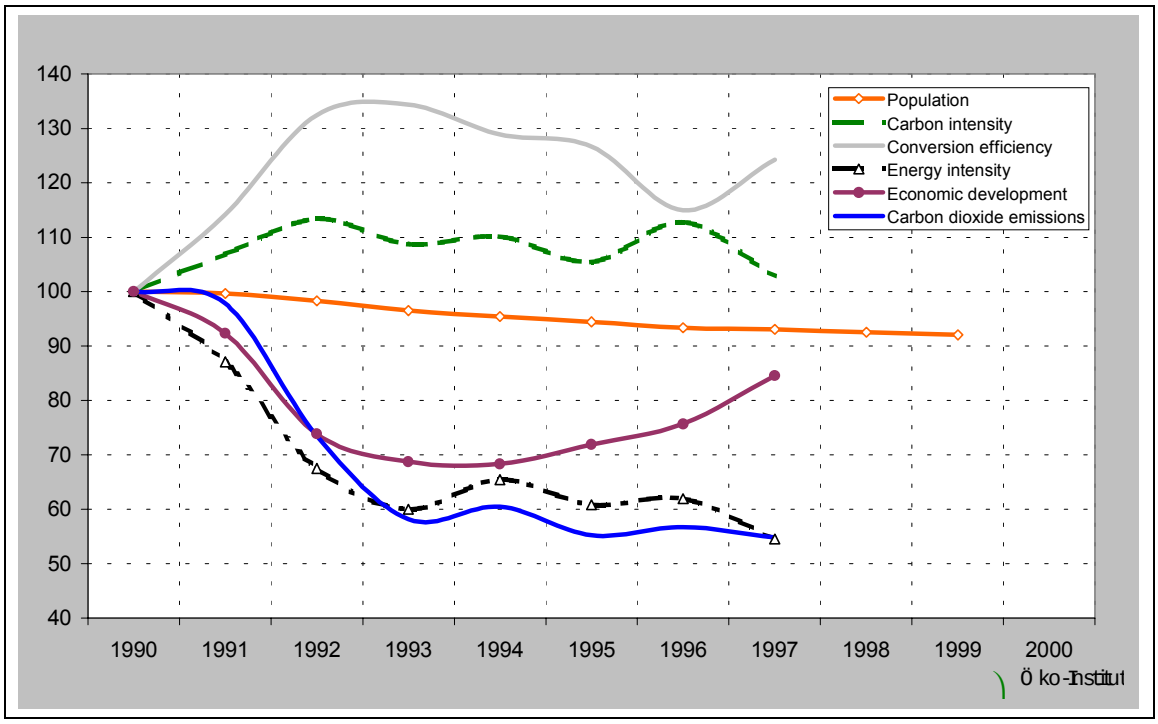
1990 4.2 kg GHGE have been emitted per $US\$_{@'95PPP}$ produced. This is nearly sevenfold above the average EU carbon intensity. Due to the only slightly improvement in Estonian carbon intensity is still sixfold above the EU average in 1997 (3,4 kg GHGE/US$).

VOC emissions where cut by more than half between 1990 and 1997. NO_x emissions declined by almost 40%. Data on SO_2 emissions is not available.

2.2.7.2 Driving forces

The following figure shows five key factors (forces) that influence the development of CO_2 emissions (compare 2.1.7.2).

Figure 2: Driving Forces of Estonian CO_2 Emissions



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Obviously population growth did not influence the development of CO_2 emissions in Estonia substantially. Opposite to that the economic development did have an substantial impact. The economic decline between 1990 and 1993 was mainly responsible for the decline of Estonian CO_2 emissions. 1995 the economy started to recover. However, the economic recovery did not induce an increase of CO_2 emissions again.

Obviously there is a strong correlation between energy efficiency and absolute CO_2 emissions. A decline in energy intensity results in a correspondingly decline of CO_2 emissions. Despite a deterioration of the conversion efficiency energy intensity decreased until 1993 and remained on that level hereafter. However, due to the shift to oil shale carbon intensity increased by about and compensated thus way some of the improvements in energy intensity.

This figure shows that efforts to improve the conversion efficiency and to reduce carbon intensity should be the main focus of a Estonian strategy for greenhouse gas mitigation.

2.3 Hungary

2.3.1 Demographic and Economic Trends

Hungary has about 10 million habitants. The total population has been rather stable during the nineties. The population decreased only slightly between 1990 and 1999 by

3%. About 7 million people are between 15 an 64 (economic active population). This figure did not change during the nineties. However, due to labour market liberalisation the labour force decrease by about 20% between 1990 and 1998 (World Bank 1999). The unemployment rate rose from below 2% in 1996 to nearly 6% in 1998 (MOP 1999, p. 281). Employment in agriculture was cut by two thirds between 1990 and 1998 and by two fifth in industry. Merely employment in services did not decreased substantially (-10%).

The number of apartments increased by 5% from about 3.8 to more than 4 million apartments. This caused a decline in the average occupancy form 2.7 to 2.5 persons per apartment. Due to the decline in overall population the decrease in average occupancy is slightly above the increase of apartments by about 7%.

With start of the transition the economy declined substantially. Real Gross Domestic Product (GDP) decreased between 1990 and 1992 by 15%. It remained about 2 years on that level and started to grow again from 1994. However, in 1997 the real GDP is still 6% below the 1990 level (World Bank 1999).

2.3.2 Primary Energy Supply

Total Primary Energy Supply (TPES) decreased from 28.6 mtoe (million tones of oil equivalent) by 15% between 1990 and 1994. From 1995 to 1998 it increased again to about 25 mtoe which is about 87% of the 1990 level.

2.3.2.1 Development of the Primary Energy Structure

The primary energy supply showed a quite balanced picture. About 30% of total primary energy supply (TPES) was covered by oil and gas each. 22% of TPES were solid fuels and 17% other fuels, which was manly uranium for nuclear power plants. The shares of all fuels were decreasing except of gas. Solid fuels showed the sharpest decline. Their share went down by 5 percentage points to 17%. The share of oil and other fuels decreased only slightly by 2 percentage points each. Opposite to that the share of gas increased substantially. In 1998 more than two fifth (41%) of Hungarian TPES was covered by gas (DG XVII 1998).

In absolute terms the picture is as follows: The consumption of solid fuels decreased from nearly 6.2 mtoe by 30% to 4.2 mtoe in 1998. The consumption of oil deceased between 1990 and 1991 from 8.6 to 7.7 mtoe (-10%). It remained on that level until 1997 and decreased then again to about 80% of the 1990 level (6.9 mtoe in 1998). Other fuels decreased from almost 5 mtoe in 1990 to 4 mtoe in 1993 and remained on that level until 1996 but decreased again to 75% of its 1990 level in recent years. Although the demand for natural gas was also decreasing in the first years of that period by almost 15% it increased again since 1993. In 1998 10.4 mtoe natural gas were consumed in Hungary. That is 14% above the 1990 level.

2.3.2.2 Energy Imports and Exports

Hungary is a net importer of fossil fuels although it produces each of the three fossil fuels domestically. However, more than 55% of fossil fuel supply derived from imports in 1990. This share is slightly increasing to almost 60% in 1998. Domestic oil production covers only 20 to 30% of the Hungarian oil demand. Correspondingly about three quarters of oil demand comes from abroad. For solid fuels the picture is opposite: about 70% of solid fuel demand is covered by domestic production, the rest is imported. Parallel to the increase in gas consumption the import quota increased from 58 to about 65% between 1990 and 1996.

Oil imports decreased between 1990 and 1996 from 6.5 to 5.5 mtoe (-15%). With natural gas the picture was quite different. Imports increased from 5.2 mtoe in 1990 to 6.6 mtoe in 1996. This is equivalent to an increase of nearly 30%.

2.3.2.3 Primary Energy Consumption per Capita

The primary energy consumption per capita was about 2.8 toe in 1990. Until 1994 dropped slightly by about 15% to 2.4 toe per capita and started to increase again hereafter. In 1998 in average 2.5 toe were consumed per capita. That is still 10% below the 1990 level. Compared to the average EU level the Hungarian primary energy consumption per capita was 25% below the EU average in 1990 and dropped slightly more than 30% below the EU average in 1996.

2.3.2.4 Primary Energy Supply per GDP

The energy intensity of the Hungarian economy did not follow a clear trend. In 1990 about 0.37 kg oil equivalent were used to produce one $US\$_{1995}$ of GDP (calculated with Purchasing Power Parities). It increased to 0.4 kg oil equivalent in 1991 but went down hereafter to 0.35 kg oil equivalent in 1997. This is about 7% below the 1990 level.

Compared with the EU the Hungarian energy intensity is between 1990 and 1996 constantly about 90 to 100% above the average EU energy intensity (0.19 kg oil equivalent per $US\$_{@'95PPP}$)

2.3.3 Final Energy Consumption

Total final energy consumption dropped by almost a fourth between 1990 and 1994 but started to increase again in subsequently years. However, in 1998 final energy consumption was still 15% below the 1990 level. This was mainly due to the decline in demand for solid fuels and oil which decreased until 1996 to 40 respectively 60% of its 1990 levels. Demand for heat decreased by merely 20% until 1996 but increased again to its 1990 level hereafter. Electricity demand decreased only slightly by 10% between 1990 and 1993 and remained on that level hereafter. Opposite to that gas demand initially was rather stable but started to enlarge since 1993. In 1996 it was almost 30% above its 1990 level but diminished again slightly hereafter.

Due to theses developments the share of solid fuels and oil was decreasing during the nineties whereas the shares of electricity was quite constant. The share of heat increased from 11 to 14% and the share of gas from 28 to 35%.

Half of the final energy consumption (52%) was 1990 consumed in the residential and commercial sector. Nearly a third of final energy went to industry and merely 16% to the transport sector. During the 90ties the share of the residential and commercial sector increased to about 60% whereas the share of the industrial sector decreased to almost 25%.

In absolute terms the consumption declined from 20 mtoe in 1990 by 22% to 15.6 mtoe in 1996. The development of energy consumption in industry was quite parallel to the development of total final consumption. More than 10 mtoe of final energy have been 1990 consumed in the commercial and residential sector. Until 1992 it decreased to 9 mtoe but raised again in subsequent years. In 1997/98 it is close to its 1990 level. Final energy consumption in industry shrank from 6.4 mtoe in 1990 to 3.7 mtoe in 1996 and raised again to 4.5 mtoe in 1998.

2.3.4 Electricity Generation

Despite decreasing electricity demand gross electricity generation increased between 1990 and 1998 by almost a third. The additional electricity generated substituted mainly electricity imports from Ukraine. Apart from Ukraine only electricity imports from Slovakia are of major importance. All other electricity imports or exports were substantially below 1 TWh during the whole period. Overall net electricity imports went down from more than 11 TWh (a third of overall electricity demand) to about 1 TWh in 1998.

Almost half of domestic electricity generation derived from nuclear power plants. The other half is generated by thermal power plants. Hydro and wind capacities are rather small and amount to less than 1% of electricity generation. Electricity generation from nuclear energy did not change during the nineties. All additional electricity generation was covered by thermal power plants. Due to that the share of thermal power plants in electricity generation increased to more than 60% whereas the share of nuclear energy shrank to less than 40%.

Almost two thirds of electricity from thermal power plants were 1990 generated from solid fuels. The share of gas in electricity generation was 30%. Oil had only a minor share in 1990 but almost all additional electricity generation during the nineties came from oil fuelled power plants. Oil input for electricity generation were roughly fourfold in 1998. Electricity generation from gas is approximately the same in 1998 as in 1990. Opposite to that electricity generation from solid fuels declined by more than 10% between 1990 and 1998.

2.3.5 District heating

Almost 640.000 households are connected to district heating systems. This corresponds to a share of about 15% of all households. Grid capacity declined by nearly 25% during the nineties. However, the number of household connected to the grid remained more or less constant.

Heat generation shrank from 89 PJ in 1994 by 30% to 62 PJ in 1998. Due to efficiency increases heat generation declined faster than final head demand. Almost 50% of the heat was 1994 generated in CHP plants. Until 1998 the share of CHP plants raised to more than 60%.

2.3.6 Energy Markets

2.3.6.1 Electricity Market

2.3.6.1.1 Electricity Generation

The large thermal power plants are operated by 10 companies. The privatisation of most theses companies has been completed. Power generation has been opened for foreign investors. Some of these companies (e.g. Budapesti Erõmû Co.) in the meantime are dominated by foreign companies. However, direct or indirect state influence through the national utility Magyar Villamos Mûvek Co. (MVM Co.) is still existing (Table 2).

Table 2: Main Shareholders in the Electricity Generation in Hungary

	Bakony Power Stn	Buda-pest Power Stn	Pecs	Vertes	Matra	Tisza	Duna-menti	Paks	Borsod	Csepel	EMA Power Ltd.	Tiszaviz Hydro
					- Share percentage, Dec. 31, 1998 -							
State ownership	25,14	2,88	16,77	41,64	0,59							100,00
MVM Co.				42,92	25,49		25,00	99,95				
Transelectro Ltd.	25,05											
EuroInvest Ltd.	25,05											
Mecsek Energia Ltd.			68,45									
Nograd Coal ltd.									16,04			
Tisza Power Plant Co.									67,92			
Dunaferr Co.											50,00	
AES Hungary Investment Ltd.									16,04			
AES Summit Generation Ltd.					28,57	95,77						
EPIC Energy Hungary BV											50,00	
EnBW AG					21,43							
Imatran Voima Oy IVO		14,79										
IVO Holding		25,00										
Tomen Corporation		39,79										
Tractebel SA							73,75					
Powergen Holdings B.W.										100,00		
Total	**75,24**	**82,46**	**85,22**	**84,56**	**76,08**	**95,77**	**98,75**	**99,95**	**100,00**	**100,00**	**100,00**	**100,00**

There is only one nuclear power plant in Hungary, Paksi Atomerõmû Rt., located in the south. It is state owned through the Magyar Villamos Mûvek Co. (MVM Co.) the national utility.

Paksi Atomerõmû Co. is a state owned but profit run. Though the Government thought of privatising the plant and though the Nuclear Act of 1996 makes it private ownership of nuclear facilities possible, there are now no plans to sell it according to our information.

The share of hydro in Hungary is very small. There is only one hydro power plant, the Tiszavíz Vízerõmû Ltd. which is 100 % state owned, but since the built in heat capacity is very big in the district heating industry, there could be major opportunities for cogeneration in the future.

Information on municipal cogeneration plants and their ownership structure would require further research. What can be said is that in general, the share of cogeneration is very small in Hungary.

Industrial power plants are also negligible in terms of the total generation capacity of the country (about 200 MW of the 7,500 MW total installed capacity in the country), but as a recent example has shown,[2] it could be expected that more and more privatised companies will have their own power plants built.

2.3.6.1.2 Electricity Transmission and Distribution

The electricity transmission grid is state owned and operated by Magyar Villamos Mûvek Rt. (MVM Rt.). MVM Rt. is a state owned company and is the system operator for the transmission grid through the Országos Villamostávvezeték Rt. (National Power Line Company Ltd.) which is nearly 100% property of MVM Rt.

According to the regulations in force, the basic role of MVM Rt. is the operation control of the power system, as well as electricity transmission and wholesale. This includes electricity export-import as well. MVM Rt. purchases electricity from the power plants or import sources, and sells it to the distribution companies. During its operation, MVM Rt. is obliged to ensure the optimal utilisation of the power plants and the national grid, with the least cost.

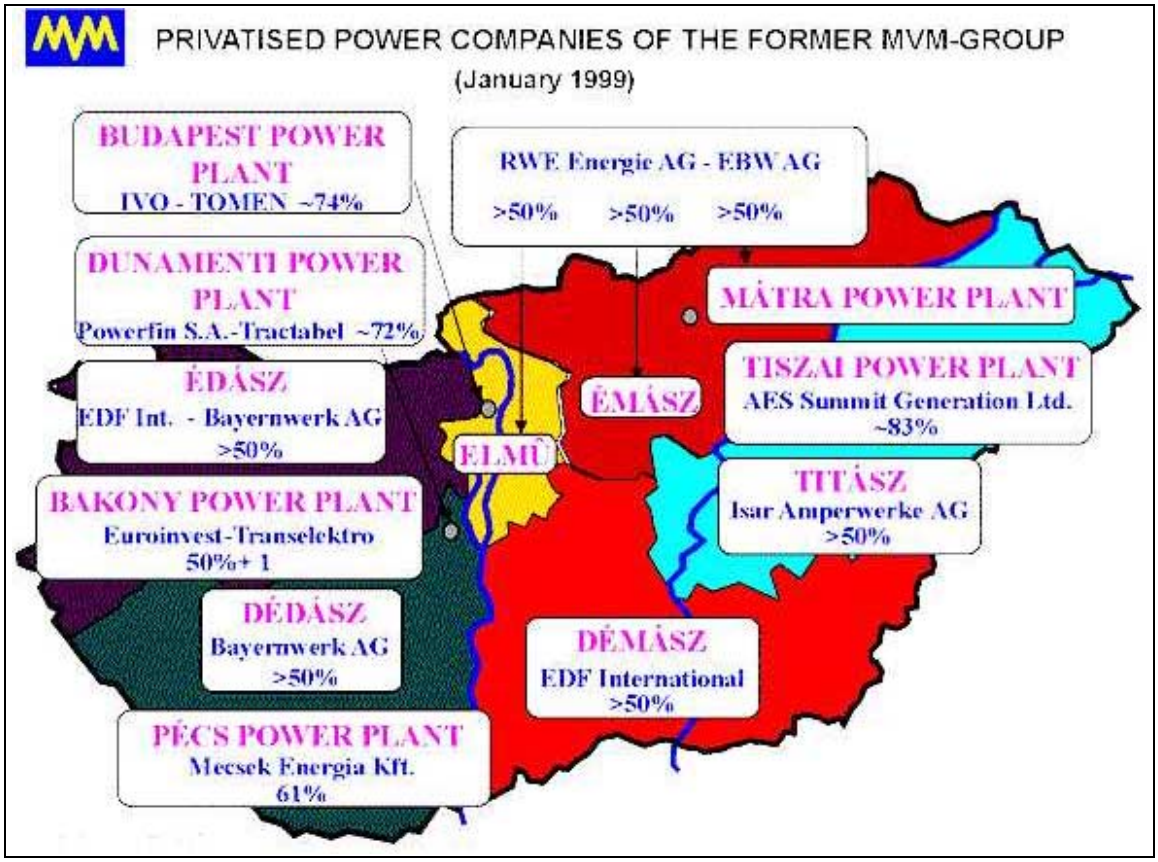
The electricity distribution grid is operated by 6 regional distribution companies: ELMÜ Co., ÉDÁSZ Co., ÉMÁSZ Co., DÉDÁSZ Co., DÉMÁSZ Co., and TISÁSZ Co. which have all been partly privatised in late 1995 (Table 3, Figure 3).

[2] The Borsodi Vegyi Kombinát, a chemical factory, was bought by a German company who recently proceed to build a power plant for the factory.

Table 3: Main Shareholders in the Electricity Distribution in Hungary

	DÉMÁSZ	ÉMÁSZ	ELMÜ	TITÁSZ	DÉDÁSZ	ÉDÁSZ
	- Share percentage, Dec. 31, 1998 -					
State ownership		2,18	4,66	5,41	10,75	7,20
Morgan Guaranty Trust (US)	25,04					
RWE Energie AG (D)		50,00	50,62			
EnBW AG (D)		21,43	25,00			
Isar Amperwerke AG (D)				75,00		
Bayernwerk AG (D)					47,25	
Bayernwerk Hungaria Co, (D)						23,77
Deutsche Börse AG (D)					15,29	5,97
Electricite de France Int'l (France)	50,00					27,38
Total	**75,04**	**73,61**	**80,28**	**80,41**	**73,29**	**64,32**

Figure 3: Power Distribution Companies and Main Power Plants



Source: MVM 1999

In Hungary the Single buyer system prevails and this system is likely to remain after the partial liberalisation of the electricity market, due to start in 2001. The Hungarian elec-

tricity system can be characterised mainly as a single buyer model in the current situation. All the generator companies selling electricity to the only transmission company and then the distributors are purchased the agreed amount of electricity from the grid.

2.3.6.2 District Heating Market

A new District Heating Act was passed in 1998 and privatisation of the district heating companies has slowly begun. It is therefore not possible at this point to know much about the ownership structure and the number of companies that will remain. It is not possible either to say at this point when the privatisation will finish. Before privatisation began, we can say that there were more than 600 companies, mainly owned by the municipalities, usually one heating plant owned by one company, except for Budapest where, because of its size, one company owns more than one heating plant.

District heating grids are normally owned by the municipalities, but here too, privatisation has started and it is difficult to know how the ownership will change as a result.

2.3.6.3 Gas Market

Gas production, imports and exports as well as the transmission grid are all owned and operated by Magyar Olaj-és Gázipar Co. (MOL), the state owned utility. MOL Co. enjoys a monopoly over these activities. It was partly privatised to expert investors but the state has retained 25 % + 1 shares. Other investors in MOL are the Bank of New York, USA, with 38.17% of shares.

There are 9 regional distribution companies: DDGÁZ Co., DÉGÁZ Co., ÉGÁZ Co., FÕGÁZ Co., KÖGÁZ Co., TIGÁZ Co., ZAB Co., FÕNIX-GÁZ Ltd., MOL-GÁZ Ltd. Privatisation of most of these companies has been completed. Some of the gas distribution companies are dominated by foreign companies in the meantime (Table 4).

Table 4: Main shareholders in the gas distribution in Hungary

	MOL Co,	DDGÁZ	DÉGÁZ	ÉGÁZ	FÕGÁZ	KÖGÁZ	TIGÁZ
				- Share percentage, Dec. 31, 1998 -			
State ownership	25,00	0,36					0,23
The Bank of New York (US)	38,17	41,21					
Ruhrgas (D)		40,19					
VEW ENERGIE AG (D)					16,34		
Ruhrgas Energie Hungary Ltd,					32,67		
Westfalische Gasversorg, AG (D)						29,73	
Bayernwerk Hungaria Co, (D)							25,16
RWE (D)			67,60	63,19			
Gaz de France Int'l						29,73	
EVN (Austria)							40,00
Italgas (Italy)							10,00
SNAM (Italy)							
Total	**63,17**	**81,76**	**67,60**	**63,19**	**49,01**	**59,46**	**75,39**

The activities of MOL Co. are more diversified than gas distribution as they are also involved in oil refinery, are owners of gas stations, are investing in the oil and gas market in the region, e.g. in Romania, Croatia and also expanding their involvement along the coast of the Adriatic Sea.

2.3.6.4 Mineral Oil and Coal Market

Coal production is not very important in Hungary since closing mines is part of the Government's policy since the early 1990s. Some mines were sold along with the coal power plants during the privatisation and have now become private ownership. The Government is about to phase out all coal mining and delays to implementing this are due to the social aspects of the question.

Mineral oil production is operated by MOL Co. but since Hungary has very small reserves of its own, MOL tries to involve itself in extraction in other countries.

2.3.6.5 Development of Prices

Trends in energy prices have been very heterogeneous. However, some remarkable patterns can be identified. In general prices in nominal terms increase substantially. Though, in real terms prices for industry declined or remained constant between 1990 and 1997 whereas prices for the residential sector increased.

Despite increasing nominal electricity prices for residential purposes they did not increase in real terms until 1994 when the real electricity price was 30% below the 1990 level. Since then nominal price increases where higher than inflation which resulted in a increase or real electricity prices to 20% above the 1990 level in 1997. Nominal price increases for industry were rather small. Correspondingly real electricity prices for industry shrank substantially and were 1998 50% below the 1990 level.

Nearly the same pattern applies to gas prices, both, for industry and for the residential sector. Nominal oil prices increases for industry where more or less in line with inflation. Thus real oil prices did not change considerably during the nineties and are exactly on the same level in 1997 as in 1990.

Heat prices for residential purposes were increased by factor four between 1990 and 1991 in nominal terms. This is equivalent to a real price increase by almost 200%. However, due to inflation real heat prices decreased again in subsequent years but are in 1997 still about 90% above the 1990 level.

2.3.7 Energy and the Environment

2.3.7.1 Greenhouse Gas Emissions

Greenhouse gas emissions (three gas basket) went down between 1990 and 1997 from about 87 to nearly 79 million tons of greenhouse gas equivalent (GHGE). This corre-

sponds to a decline by 10%. Four fifth of GHG emissions derive from fuel combustion. Due to the rise of fugitive emissions from fuels this share reduced slightly to 75% in 1997.

With regard to the individual greenhouse gases the development is as follows: about 75% of the GHG emissions are CO_2 and around 22% are Methane (CH_4) emissions. The share of N_2O emissions was below 3%. Despite small deviations this structure did not change much during the nineties.

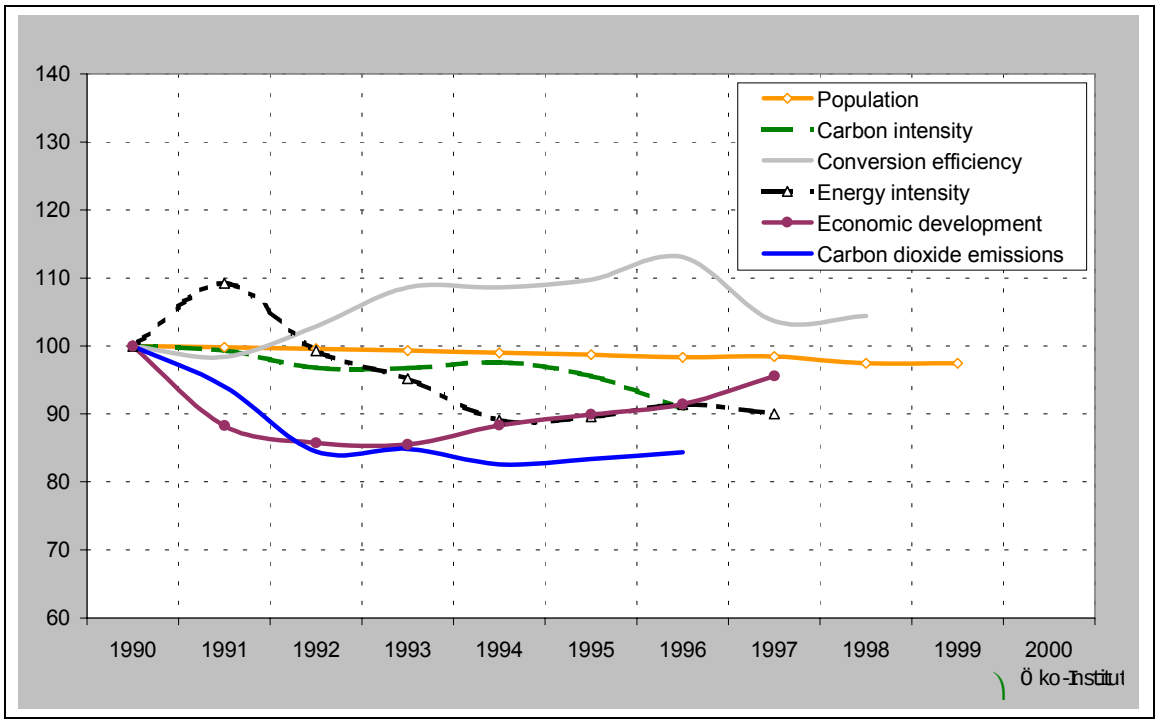
Approximately 8.5 t GHGE have been emitted per capita in 1990. This was 27% below the EU average (11,5 t GHGE/Cap.). Per capita GHG emissions decreased more or less in line with the overall GHG emissions. In 1994 they were 10% below the 1990 level but increased again hereafter. In 1996 7.8 t GHGE have been emitted per capita. This was still 7% below the 1990 level and almost 30% below the EU average.

The carbon intensity – calculated by the ratio of overall GHG emissions to GDP at 1995 real PPP – had a quite different development. It rose between 1990 and 1991 from 1.1 to 1.3 kg GHGE per $US\$_{@'95PPP}$ (+15%) but went down again hereafter until 1996 to its 1990 level. The carbon intensity of the Hungarian economy was in 1990 almost 80% above the EU average. As the average EU carbon intensity decreased until 1996 the Hungarian carbon intensity was more than double as high as the EU average.

2.3.7.2 Driving forces

The following figure shows five key factors (forces) that influence the development of CO_2 emissions (compare 2.1.7.2).

Figure 4: Driving Forces of Hungarian CO_2 Emissions



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Obviously population growth did not influence the development of CO_2 emissions in Hungary. Opposite to that the economic development did have an substantial impact. The economic decline between 1990 and 1992/93 contributed substantially to the decline of CO_2 emissions. Due to the increasing energy intensity between 1990 and 1991 CO_2 emissions declined slower than the economy. Due to improvements of both, the energy intensity as well as carbon intensity hereafter CO_2 emissions did not increase although the economy started to grow again since 1994. Conversion efficiency went until 1996 by approximately 13% but improved again almost to the level of 1990. However, conversion efficiency is still low and could be improve further. Hence measures that address this opportunity should play a key role in any Hungarian climate and environmental protection strategy.

2.4 Poland

2.4.1 Demographic and Economic Trends

Poland has about 38 million habitants. The total population has been rather stable during the nineties and grew only by 1% between 1990 and 1997. However, the population between 15 an 64 (economic active population) and hence the labour force increased by more than 5% between 1990 and 1997 (World Bank 1999). The unemployment rate has been quite high in the middle of the nineties (above 13%) but started to decline to al-

most 10% in 1998. Estimates for 2000 show that the unemployment rate might increase again at the end of the nineties to about 11.5% (MOP 1999, p. 183).

The number of apartments increased by about 5% which caused a decline in the average occupancy form 3.4 to 3.3 persons per apartment (-4%). The average size of an apartment was 60 m² in 1991. Until 1997 it increases slightly to 61 m² (+2%). As a result the total heating space went up from less than 660 to more than 700 m² in 1997 (+8%).

Between 1990 and 1991 real gross domestic product (GDP) shrank by 7% but started to increase again constantly in the following year. In 1994 the Polish GDP was already above the level of 1990 and continued to grow by 5 to 7% in real terms (World Bank 1999). 1997 it was 27% above the 1990 level. Estimates show continued growth until the end of the nineties but with a slower pace (MOP 1999, p. 183).

2.4.2 Primary Energy Supply

Total Primary Energy Supply (TPES) decreased slightly from 102 mtoe (million tones of oil equivalent) by 5% to 96.6 mtoe between 1990 and 1994. Since than TPES increased again to more than 108 mtoe. In 1996 it was 6% above the 1990 level.

2.4.2.1 Development of the Primary Energy Structure

The primary energy supply was dominated by solid fuels, i.e. coal. But the share of coal decreased somewhat from 74% in 1990 by 4 percentage points to 70% in 1995. The share of all other fuels did not change much except of oil. Its share increased from 13 to almost 17% in 1996. The share of gas remained around 9% and the share of other fuels around 4 to 5% (DG XVII 1998).

In absolute terms the picture is as follows: The consumption of solid fuels remained more or less 75 mtoe although it was almost 10% lower in 1994 and 1995. Supply of oil increased from 13 to 18 mtoe between 1990 and 1996 (+36%). Gas supply increased from around 9 to 9.5 mtoe in 1996 (+7%) and supply of other fuels from 4.4 to 5.2 mtoe (almost +20%).

2.4.2.2 Energy Imports and Exports

Poland is a net exporter of coal (solid fuels) and imports all of its domestic oil and natural gas demand. In 1990 20% of the domestic coal production was exported. In some of the subsequent years the export quota was somewhat above or below that level but did not change substantially during the nineties.

In absolute terms the exports of solid fuels oscillated between 14 and 18 mtoe. Oil imports increased from more than 14 to almost 18 mtoe (+24%) and gas imports from 13 to 15 mtoe (+16%).

2.4.2.3 Primary Energy Consumption per Capita

Primary energy consumption per capita was about 2.7 toe in 1990. In the following years it decreased slightly until 1994 but increased again hereafter until 1996 to 5% above its 1990 level. Polish primary energy consumption per capita was constantly more than a quarter below the European average during the nineties.

2.4.2.4 Primary Energy Supply per GDP

In 1990 more than 0.5 kg oil equivalent were used to produce one US$$_{1995}$ of GDP (calculated with Purchasing Power Parities). Compared with the EU average the Polish energy intensity is between 1990 and 1996 constantly about twice as high as the EU average. However, Polish energy intensity increased between 1990 and 1991but declined hereafter. In 1996 it was about 10% below its 1990 level.

2.4.3 Final Energy Consumption

Total final energy consumption did not change much during the period between 1990 and 1995. However, in 1996 it boosted by about 10%. With regard to individual fuels the picture is quite heterogeneous. Final consumption of oil and solid fuels (coal) increased remarkable until 1996 (+48% respectively 39%). Consumption of Gas did not change much and remained until 1996 more or less on the 1990 level. In contrast to that heat consumption dropped substantially. In 1996 it was more than 40% below its 1990 level.

In 1990 almost 30% of the final energy consumption was accommodated by coal (solid fuels). More than a quarter of final energy consumption was covered by heat. The shares of oil and electricity consumption were around 15% and the share of gas below 10%. Until 1996 this picture changed significantly. The share of solid fuels grew to more than 35% whereas the share of heat dropped sharply below 14%. The share of gas and electricity remained more or less constant. Just the share of oil increased substantially too and was around 20% in 1996.

Half of the total energy consumption is consumed in the residential and commercial sector. Despite little oscillations this share grew only slightly by 2 percentage points until 1996. Almost 40% of final energy was consumed in the industrial sector in 1990. Until 1990 the share of industry reduced to 35%. The share of the transport sector grew by to percentage points from 13 to 15% in 1996.

In absolute terms the consumption grew from 61 mtoe in 1990 by 11% to more than 66 mtoe in 1996. Consumption of solid fuels increased from 17 to almost 24 mtoe and consumption of oil grew form 9 to almost 14 mtoe in 1996. Heat demand went down from 15.6 to 9.2 mtoe. Final energy demand amounted to 23 mtoe in 1996. This is exactly the same amount as in 1990 although it was down to 19 mtoe in the meantime. Final energy consumption of the residential and commercial sector increased from 29 to more than 33

mtoe (+14%). The transport sector performed the highest increase. Final energy demand grew by more than 25% from 7.8 to 10 mtoe.

2.4.4 Electricity Generation

Gross electricity generation did not change substantially between 1990 and 1996. It grew slightly by about 5% from 136 to almost 143 TWh. The development of net electricity generation was quite similar.

Except from less than 3% electricity from hydro and wind power plants all electricity is generated in thermal power plants. Almost all thermal power plants are coal fired plants. Electricity generation from oil, gas or other fuels is negligible, together below 4% with decreasing trend during the nineties.

Polish electricity imports and exports are nearly balanced although there is some electricity trade with its neighbours. Between 1990 and 1997 Poland imported between 5 to 10 TWh, mainly from Germany and Ukraine although imports from the latter country were reduced substantially in the early nineties. Electricity exports were between 11.5 and 7 TWh, in particular to Germany and the Czech Republic. Electricity exports exceeded imports slightly but are negligible compared to domestic electricity consumption (below 4%).

2.4.5 District heating

Data provision on district heating is very poor in Poland. However, some remarkable patterns can be identified. The length of the district heating grid grew by more than a third between 1990 and 1997. Due to efficiency improvements heat generation went down between 1993 and 1997 by more than 25%. Two thirds of all heat generation was produced in CHP plants although this share was decreasing. In 1997 almost half of all heat generated came from heat and not from CHP plants.

2.4.6 Energy Markets

2.4.6.1 Electricity Market

Currently, there are 47 public thermal power plants (co-generation plants) and 124 public hydro plants in Poland. Most of the thermal public plants are fired with a hard coal. Additionally, there are 17 large power plants (3 are fired with a brown coal and 14 with a hard coal). Additionally, there are 178 industrial power plants. The privatisation process of the power generation sector has begun in 1998. On July 2, 1998 the Cabinet's Economic Council approved the document: "Program and Conditions for Energy Sector Privatisation". The document stipulates that all the energy enterprises will be privatised individually. The implementation of the program is not very successful and it is often criticised for the delays.

Almost the whole energy sector has been commercialised, which means that the generation and distribution companies operate on a commercial basis and they are the sole shareholder companies of the State Treasury (before they were state-owned enterprises).

2.4.6.1.1 Electricity Generation

Most of the public power plants are the sole shareholder companies of the State Treasury. The only one not yet commercialised is the Turów Power Plant (fourth the largest electricity producer in Poland, with annual output of 9,167 GWh). Pątnów-Adamów-Konin Power Plant Group was the first to be privatised. Currently, it is owned by: Elektrim S.A. (20 % of shares) and the State Treasury (80 %).

The privatisation process of Połaniec Power Plant (1,600 MW) will be completed in December 1999. There are three investors interested in purchasing the shares: AEF Horizons, Easter Power and Energy and Tractebel.

Additionally, by the end of 1999 the Ministry of State Treasury intends to sell the Rybnik Power Plant (1,640 MW, fired with hard coal). The ministry decided to privatise the Polaniec and Rybnik Power Plants sooner than other power plants because of their low production costs and advanced privatisation process.

The biggest single producer of electricity in Poland, Bełchatów Power Plant, has been commercialised recently as a sole shareholder company of the State Treasury. The Plant is fired with a brown coal and the installed capacity is 4,320 MW. The electricity generated in 1997 amounted 27,360 GWh.

The ministry's policy is to encourage the development of competitiveness in the energy market. If the Ministry of State Treasury successfully implements its privatisation program, almost all public thermal plants will be partially privatised by the end of 1999. Consequently, only four thermal plants will remain the sole shareholder companies of the State Treasury: Zabrze Thermal Plant – 76 MW, Bydgoszcz Thermal Plant – 204 MW, Bytom Thermal Plant – 118 MW and Łódź Thermal Plant – 598 MW.

Table 5: The Ten Biggest Electricity Producers in Poland

Name of the plant	Ownership structure	Installed capacity [MW]	Fuel type
BEŁCHATÓW Public Power Plant	Sole shareholder company of the State Treasury	4,320	Braun coal
PAK S.A.	A join stock company. 80% of shares - the State Treasury, 20% ELEKTRIM S.A.	2,738	Braun coal
KOZIENICE S.A.	Sole shareholder company of the State Treasury	2,700	Hard coal
TURÓW Public Power Plant	State-owned enterprise (not commercialised yet)	2,000	Braun coal
DOLNA ODRA S.A. Public Power Plant Group	Sole shareholder company of the State Treasury	1,768	Hard coal
RYBNIK S.A. Public Power Plant	Sole shareholder company of the State Treasury	1,640	Hard coal
T.KOŚCIUSZKO S.A. Public Power Plant	Sole shareholder company of the state Treasury. Currently, an ongoing privatisation process. This process shall be completed by December 1999	1,600	Hard coal
JAWORZNO III S.A. Public Power Plant	Sole shareholder company of the State Treasury	1,511	Hard coal
ŁAZISKA S.A Public Power Plant	Sole shareholder company of the State Treasury	1,100	Hard coal
ELEKTROCIEPŁOWNIE WARSZAWSKIE S.A. Public Thermal Power Plant Group	Sole shareholder company of the State Treasury. The privatisation process may be finished by the end of October 1999	945	Hard coal

In 1997 the installed capacity in industrial power plants amounted to 2,958 MW, electricity production of such plants was 7,988 GWh (6,345 GWh in co-generation). The industrial power plants delivered 278 GWh of electricity to the grid in 1997. The largest amount of power generated in industrial power plants occurred in following industries: production of chemicals (2,400 GWh in 1997); production of coke and oil products (1,751 GWh).

2.4.6.1.2 Electricity Transmission and Distribution

Currently the transmission grid is operated by Polish Grid Company (PSE S.A.), a sole shareholder company of the State Treasury. According to the Ministry of Treasury the privatisation of the company will start in 2000 and will be completed by the end of 2002. After 2002 the role of the company will be limited to transmission services only (currently PSE S.A. is also system operator).

At present there are 33 distribution companies in Poland. All of them are sole shareholder companies of the State Treasury. Their privatisation will begin in fall 1999 and shall be finished by the end of 2002. The Ministry of Treasury assumed that the best way of purchasing the distribution companies is the negotiation procedure with interested investors and decided that privatisation via stock exchange would be used only as a complementary measure. According to the Ministry's guidelines, the negotiation procedure will be preceded by the open invitation. The Ministry argues that this procedure should encourage openness to public, clarity and competitiveness. Regarding the competitiveness, the safe share of a single investor in the market was recognised as 12 - 15 % (measured by the electricity sales to the final customers). It is possible that some time after privatisation the Ministry of Treasury or the President of the Consumer and Competition Protection Office will allow bigger concentration of the shares. The State Treasury will begin privatisation with offering to the investors the minority shares e.g. 20 - 25 % of shares of each company. The majority block of shares will be offered after investors meet their investment obligations and obligations to employees.

The Polish Energy Law allows for the Third Party Access to the grid. Depending on their yearly electricity purchases final consumers have or will have access to the grid. Although the TPA rule is limited to the fuels extracted in Poland and energy produced from them), Polish government has declared to abolish this limitation by the and of 2002.

2.4.6.2 District Heating Market

Most of the Polish district heating grids have been transformed to companies operating on the commercial basis e.g. join stock (S.A.) and limited liability companies (Sp.z o.o.). Commonly, district heating (distribution) companies (przedsiębiorstwa energetyki cieplnej, PEC) are owned by the municipalities (gmina). For instance the District Heating Company (S.A.) in Krakow, which supplies heat to over 7,000 buildings with a heating space equal 13,275 m^2 is fully owned by Krakow municipality. However, many of the distribution companies that are the sole shareholder companies of the municipalities have begun to offer the shares to the strategic investors.

Wroclaws' District Heating Company, which delivers heat to about 55 % of Wroclaw residences is a joint stock company owned in 95 % by municipality, and in 5 % of by one of the thermal power plants and a building co-operative from that region. In some cases shares are bought by other investors, like the company in Warsaw, that delivers heat mainly to public buildings (hospitals etc.) which is owned by ABB (80 %) and the State Treasury (20 %). In the Silesia region some of the distribution companies are owned by employees, as in the case where distribution companies were formerly part of the mining enterprises. During the restructuring and liquidation processes of mining enterprises the heat distribution divisions were separated from these enterprises. It facilitates the liquidation process and partially compensates loss of jobs.

It should be noted, however, that the ownership structure is changing very rapidly, and there exists no commonly available centralised database that would provide regularly updated information in this respect. Considering that the number of independent entities providing district heat is around 1,000, or more (even obtaining the exact number was impossible) any dealings in this area should be approached from the municipal level.

At the moment there are 376 heat plants with installed capacity up to 100 MW each. These plants have a range of different ownership structures. Often they are owned by the heat distribution companies or are the join/limited liability companies owned by municipalities. The process of their privatisation is similar to this of heat distribution companies. Some privately owned plants are known as well.

2.4.6.3 Gas Market

Polish Oil and Gas Company (Polskie Górnictwo Naftowe i Gazownictwo - PGNiG S.A.) has monopolistic position in the Polish gas market; production, imports, transmission and distribution are operated by PGNiG S.A. The guidelines for restructuring the company were adopted by the Council of Ministers in a document of April 2, 1996, entitled "Program of restructuring the public utility enterprise - PGNiG". Since that time PGNiG has been commercialised as the sole shareholder company of the State Treasury. According to the government's program, PGNiG S.A. has established "daughter companies", which before operated as divisions of PGNiG. There are about 20 such companies, which incorporate assets of the former units. They deal with a wide range of tasks, such as, e.g., exploration, maintenance and construction of utilities. Among them there are: GEOFIZYKA Krakow, Oil and Gas Exploration Jaslo, Gas Equipment Repair Works ZRUG - Torun, Drilling Unit - Zielona Gora.

According to Aleksander Findzynski (President of PGNiG S.A.) the next step of PGNiG S.A. restructuring should be separation of the transmission and distribution services. The PGNiG S.A. is often criticised for delays in its reorganisation.

Currently, the Ministry of Treasury is in process of choosing the Privatisation Advisor, who will be in charge of preparation of the gas sector analysis and will update the aforementioned "Program of restructuring the public utility enterprise - PGNiG".

2.4.6.4 Oil Market

Polish refineries use about 15 million tonnes of crude oil, whereas in-country oil production amounts to about 300,000 tonnes per year, less then 2 % of the total demand. In-country production plays insignificant role in the oil balance of Poland, but still cannot be neglected. The recent findings show, that oil extraction can double in a few years.

Historically, the major source of crude oil in Poland were oil pools in Karpaty mountains, famous for the first in the world oil-well installation in mid nineteenth century. At present they are operated by PGNiG S.A. However, due to long period of service, the deposits are almost exhausted. The largest Polish oil pools are located in north-west part

of the country. They are operated also by PGNiG S.A. It is estimated, that total extractable oil deposits are up to 20 million tonnes.

Second largest oil producer in Poland is Petrobaltic, state owned company operating oil-rigs in Polish shelf. Annual extraction in 1996 was almost 150,000 tonnes, with a growing trend. Petrobaltic plans to build new wells in the sea shelf belonging to the Baltic Republics and Kaliningrad region.

2.4.6.5 Coal Market

The vast majority of coal mines are located in the upper Silesia region, with only a few in other parts of Poland (nearby Lublin and Walbrzych). The table below lists major coal establishments.

Table 6: Coal holdings in Poland

Coal Establishment	Sales in 1998 [million PLZ]
Nadwilańska Spółka Węglowa SA, Tychy	2,832
Jastrzębska Spółka Węglowa SA, Jastrzębie Zdrój	2,583
Katowicki Holding Węglowy SA, Katowice	2,552
Rybnicka Spółka Węglowa S.A.,Rybnik	2,130
Gliwicka Spółka Węglowa SA, Gliwice	1,975
Rudzka Spółka Węglowa SA, Ruda Śląska	1,700
Bytomska Spółka Węglowa SA, Bytom	N/A

Source: "Rzeczpospolita" TOP500

Coal mines (approx. 60) are not legal entities. They belong to holdings called "spolka weglowa" (coal company). The coal holdings are sole shareholder company of the State Treasury (joint stock companies, owned in 100 % by the State Treasury). The exemptions are "Budryk" S.A. and "Bogdanka" S.A. coal mines, which are also sole shareholder company of the State Treasury.

There are plans to privatise several coal mines. The governmental programme of restructuring of the coal industry mentions "Budryk", "Bogdanka" and 4 more coal mines to be privatised by 2002.

2.4.6.6 Development of Prices

Energy prices developed quite heterogeneous during the nineties. But some remarkable patterns can be identified. In nominal terms all prices grew significantly. In real terms, however, not all prices increased. In particular prices for industry did not increase but decline. In contrast to that real energy prices for residential purposes increased drastically.

Electricity prices for industry grew by a factor of 5.5 between 1990 and 1997 in nominal terms. In real terms they did not increase at all. In 1997 they were more than 10% below the 1990 level. Electricity prices for industrial purposes were 2.5 fold higher than electricity for residential purposes. Due to that they developed quite different between 1990 and 1997. In nominal terms they increased by a factor of 22 which is equivalent to an increase by about 250% in real terms. The biggest jumps in residential electricity prices were in 1991 and 1992 when they grew by more than 100 respectively 30%. As result of these developments electricity prices for industry were in 1997 about 35 to 40% below prices for residential purposes.

The pattern for natural gas is rather similar. Gas price for industrial use was five fold above the price for the residential sector. Due to real price increases for residential use by nearly factor 8 and slightly decreasing gas prices for industry this relation inverted. In 1997 gas prices for industry were about 40% below gas prices for residential use.

Fuel oil prices for industry did not follow a clear trend. In real terms they oscillated in a range of 15% above and below the 1990 level but did not change substantially. In 1997 they were about 15% below the 1990 level.

Heat prices for 1990 to 1992 are not available. Therefore the development of heat prices can not be compared directly to the other energy prices. In 1993 heat prices for industry were already 25% below heat prices for residential purposes. Both, prices for industry as well as for residential uses declined slightly by about 10% in real terms until 1997. Therefor the relation between residential and industrial heat prices remained the same as in 1993.

2.4.7 Energy and the Environment

2.4.7.1 Greenhouse Gas Emissions

Greenhouse gas emissions (three gas basket) went down between 1990 and 1997 from about 460 to nearly 426 million tons of greenhouse gas equivalent (GHGE). This corresponds to a decline by 7%. More than 80% of GHG emissions derive from fuel combustion. This share increased slightly to 83% in 1997.

With regard to the individual greenhouse gases the development is as follows: 83% of the GHG emissions are CO_2 emissions. The share of Methane (CH_4) decreased between 1990 to 1997 from 13 to 11% whereas the share of N_2O emissions remained more or less constant at 4%.

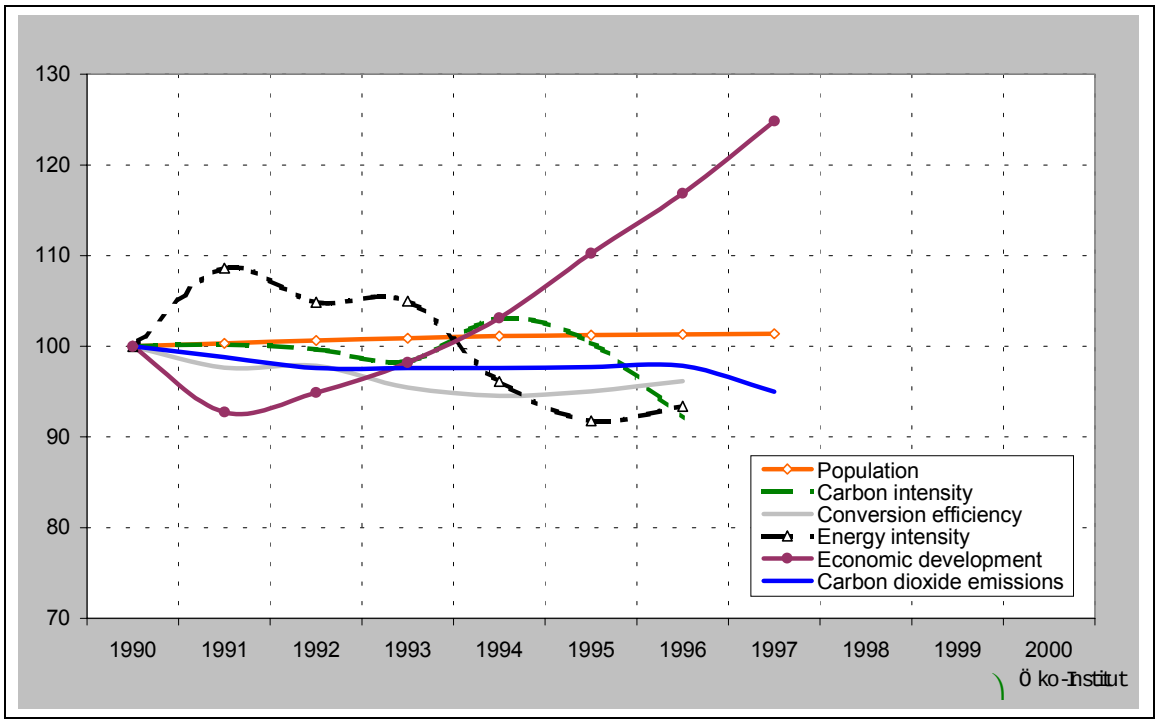
About 12 t GHGE have been emitted per capita in 1990. This was 5% above the EU average (11,5 t GHGE/Cap.). Parallel to the absolute emissions the per capita emissions decreased constantly. In 1997 11 t GHGE have been emitted per capita. That is about 8% below the 1990 level but still 5% above the EU average that decreased with the same pace.

The carbon intensity – calculated by the ratio of overall GHG emissions to GDP at 1995 real PPP – had a quite different development. In 1990 2.3 kg per US$ have been emitted. This is almost 3.7 times more than the EU average. Until 1997 the Polish carbon intensity decreased constantly be a remarkable 25%. However, in 1996 it was still 3.4 times above the EU average.

2.4.7.2 Driving forces

The following figure shows five key factors (forces) that influence the development of CO_2 emissions (compare 2.1.7.2).

Figure 5: Driving Forces for CO_2 Emissions in Poland



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Population growth in Poland was rather small. It did have a big influence on the development of CO_2 emissions. Economic decline between 1990 and 1991 contributed to a slight reduction in GHG emissions in that year. However, due to a substantial increase in energy intensity CO_2 emissions did not decrease as much as the economy declined.

In 1992 the economy started to grow again with a remarkable pace. But because energy intensity went down again the economic upturn did not result in increasing CO_2 emissions. Improvements in conversion efficiency and later on in carbon intensity kept CO_2 emissions down although the economy continued to grow.

2.5 Slovenia

2.5.1 Demographic and Economic Trends

Slovenia has about 2 million habitants. The total population has been rather stable during the nineties. In 1996 almost 14% of the labour force were unemployed. Until 1998 the unemployment rate rose by another 0.5 percentage points. According to projections it will remain on that level until 2000 (MOP 1999, p. 249).

The number of apartments increased between 1994 and 1997 by 4%. It is expected to increase by another 2% until 2000. The average occupancy decreased from 3.0 to 2.9 persons per apartment and will decrease to 2.8 until 2000. Due to this development the average size of an apartment will increase form 69.6 to 71.2 m² in 2000. This is equivalent to an increase of the overall space heating area of 8% between 1994 and 2000. In 1996 almost half of the apartments (45%) were heated by fuel oil. Wood waste accounts for 19% AND District heating for 12%. Coal, gas and electricity account only for smaller shares below 10%.

With start of the transition the economy declined substantially. Real Gross Domestic Product (GDP) decreased between 1990 and 1992 by 15%. Since then the economy increased again and has reached its 1990 level in 1996. In the subsequent year it increased again and was about 4% above the 1990 level in 1997 (World Bank 1999).

2.5.2 Primary Energy Supply

Total Primary Energy Supply (TPES) decreased from 5.2 mtoe (million tones of oil equivalent) by roughly 10% between 1990 and 1992. In 1993 it started to increase again and was 14% above the 1990 in 1996 (5.9 mtoe).

2.5.2.1 Development of the Primary Energy Structure

Oil accounted for a third of the TPES in 1990. Its share increased to almost two fifth (38%) in 1996. Both, solid fuels and other fuels, which was mainly nuclear, accounted for a quarter of TPES each. However, the share of solid fuels decreased to on fifth (20%) in 1996 whereas the share of other fuels increased to 27%. Gas was the least important fuel in Slovenia but its share increased slightly from 13% in 1990 to 15% in 1996 (DG XVII 1998).

In absolute terms the picture is as follows: The consumption of solid fuels decreased from nearly 1.4 mtoe by 15% to 1.2 mtoe in 1996. The consumption of all other fuels increased between 1990 and 1996. Both oil and gas increased by more than 25% from 1.8 to 2.3 mtoe (+29%) respectively 0.7 to 0.9 mtoe (+26%). The demand for other fuels increased slower. It rose from 1.4 to 1.6 mtoe between 1990 and 1996 (+18%).

2.5.2.2 Energy Imports and Exports

Slovenia is a net importer of fossil energy resources. In 1990 two thirds of fossil fuels were imported. This figure increased to three quarters (76%) in 1996. All oil and gas supply derives from imports. The only domestic fossil resource is coal. However, domestic coal production below the domestic demand. Due to that almost 10% of domestic coal supply were imports. Until 1996 the share of coal imports increased to 15%.

2.5.2.3 Primary Energy Consumption per Capita

The primary energy consumption per capita was about 2.6 toe in 1990. Until 1992 it dropped slightly by 11% and increased again to 3.0 toe per capita in 1996 (14% above the 1990 level). Compared to the average EU level the Czech primary energy consumption per capita was more than a quarter below the 1990 EU average. In 1992 it was 35% below the EU average but increased again and was merely 20% below the EU average in 1996.

2.5.2.4 Primary Energy Supply per GDP

The energy intensity of the Slovenian economy increased between 1990 and 1996 by roughly 14%. In 1990 about 0.23 kg oil equivalent were used to produce one $US\$_{1995}$ of GDP (calculated with Purchasing Power Parities). Until 2000 the energy intensity rose to 0.26 kg oil equivalent per $US\$_{1995}$ of GDP. Compared with the EU the Czech energy intensity is in 1990 about a quarter above the EU level. Due to the increase in the Slovenian energy intensity and a decline of the energy intensity in the EU the Slovenian energy intensity is almost two fifth above the EU level.

2.5.3 Final Energy Consumption

Total final energy consumption dropped slightly by 10% between 1990 and 1992 but increased again hereafter and was 17% above the 1990 level in 1996. The demand for oil and heat increased between 1990 and 1995 by 39% respectively 8%. Opposite to that the demand for solid fuels, gas and electricity decreased. The decline of solid fuel demand was most drastically. It shrank by almost 60% between 1990 and 1995. Gas and electricity demand declined only slightly by 15 respectively 5%.

In 1990 oil accounted for almost half of total final energy consumption (45%). However, in the subsequent years the share of oil increased by 9 percentage points to 51% in 1995. The share of heat remained quite constant at 5% whereas the shares of gas and electricity decreased slightly from 15 to 11% respectively from 25 to 21%. The share of solid fuels decreased substantially from 10% in 1990 to merely 3% in 1995.

About two fifth (43%) of total final energy were 1990 consumed in industry. Both, the transport sector and the commercial and residential sector accounted for roughly 30% of total final energy demand. However, until 1995 the picture was changed substantially. Industry accounted for merely 29% of total final energy demand whereas the transport

sector and the residential and commercial sector accounted for 35 respectively 36% of total final energy demand.

In absolute terms the consumption decreased from 3.3 mtoe in 1990 by 10% to 3.0 mtoe in 1992. After this it increased again to almost 4 mtoe in 1996. Final energy consumption in industry dropped by almost 20% from 1.4 to 1.1 mtoe in 1996. Opposite to that final energy demand in the transport sector and in the residential and commercial sector increased from roughly 1.0 to 1.4 mtoe in 1996. This is equivalent to an increase by more than 40%

2.5.4 Electricity Generation

Gross electricity generation did not follow a clear trend. It increased from 1990 to 1991 by 2% but decreased hereafter until 1993 to 94% of the 1990 level. In the subsequent years it increased again and was in 1997 6% above the 1990 level.

In 1990 the 37% of electricity was generated in nuclear power plants. 24% of the electricity was generated in hydro stations. The remaining part (39%) of the gross electricity generation derived from thermal power plants which are mainly fired by solid fuels (coal). Most Slovenian thermal power plants are combined heat and power plants. Thus about 85% of electricity generation from thermal power plants was generated in CHP plants. This structure of gross electricity generation remained quite constant during the nineties.

In 1990 Slovenia imported 12% of its final electricity demand. Due to the decline in electricity demand and increased electricity generation Slovenia became a net exporter of electricity in 1991. During the period form 1991 to 1996 it exported between 1.4 and 2.1 TWh. This was equivalent to 16% respectively 22% of the domestic electricity consumption.

2.5.5 District heating

In 1994 104,000 household were connected to a district heating system. This is equivalent to 16% of all households. All together 8.1 PJ heat have been generated to cover the heat demand. Roughly two thirds (62%) of the heat was generated in CHP plants. The remaining part was generated in conventional heat plants. Until 1996 the overall heat generation increased to 9.7 PJ, 20% more than in 1994.

2.5.6 Energy Markets

2.5.6.1 Electricity Market

2.5.6.1.1 Electricity generation

The large thermal power plants are operated by:

1. Termoelektrarna Šoštanj (Thermal Power Plant Šoštanj - TEŠ) - lignite;
2. Termoelektrarna Trbovlje (Thermal Power Plant Trbovlje - TET) - brown coal;
3. Termoelektrarna-Toplarna Ljubljana (Thermal Power & Heat Plant Ljubljana - TETO) - brown coal and hard coal imported from Indonesia, largest supplier of the town of Ljubljana DH with heat;
4. Termoelektrarna Brestanica (Thermal Power Plant Brestanica -TEB) - natural gas.

All companies are state owned companies, except Termoelektrarna-Toplarna Ljubljana which is co-owned by the municipality of Ljubljana. The privatisation of the companies has not yet started.

The nuclear power plant is operated by Nuklearna Elektrarna Krško - NEK (Nuclear Power Plant Krško) which is owned by the Republic of Slovenia since august 1998. The privatisation of the company has not yet started nor it can be predicted whether NEK will be privatised at all. NEK was built as joint (fifty-fifty) Slovene-Croatian venture, operating under Slovene law. Since the Governmental Decree from August 1999 it is joint stock company, in majority ownership of the Republic of Slovenia. However, the government of Croatia is not willing to accept this unanimous act of Slovene government. Considering ownership, the structure of management, competencies, amount of decommissioning fee and the status of decommissioning found, modernisation of the plant and other issues there are no signs that both countries will be capable to make an agreement in the near future.

The large hydro and pump storage power plants are operated by companies Dravske Elektrarne (Drava Power Plants on Drava river - north east), Savske Elektrarne (Sava Power Plants on Sava river - north west and eastern central) and Soške Elektrarne (Soča Power Plants on Soča river - west). All Companies are according to the still applied provisions of Yugoslav federal Energy Industry Act from 1981 and Law on Public Utilities from 1992 'socially owned enterprises' in form of joint-stock companies. This are legally owned by employees, however since 1992 the ownership rights are exercised by Ministry of Finance. The privatisation of the companies has not yet started.

Table 7: Power Plants in Slovenia

Name	Units	Fuel	Net capacity (MW)	Year of Commissioning	Status of Rehabilitation
Thermal Power Plants	**16**		**1,013**		
TPP Trbovlje	1	coal	105	1968	2004: desulphurisation unit
	2	gas-oil	59	1976	
TPP Brestanica	1	gas-oil	10	1943	in progress
	1	gas	11	1961	
	3	gas	63	1975	
					2000: + 2 * 115 MW
TPP Šoštanj	2	coal	54	1956	2004: Decommissioning
	1	coal	68	1960	2004: Decommissioning
	1	coal	246	1972	1995: desulphurisation unit
	1	coal	294	1977	2000: desulphurisation unit
TE TO Ljubljana	2	coal	58	1966	1989
	1	coal	45	1984	
Nuclear Power Plants	**1**		**664**		
NPP Krško	1		664	1981	Reconstruction in progress, finish until 1999, +40MW
Hydro Power Plants	**122**		**740**		
Drava river	20		506		
Fala	1		16	1977	
	2		42	1991	
Dravograd	2		14	1943	2000: + 4,5 MW
Mariborski otok	2		34	1948	2000: + 14 MW
Vuzenica	2		45	1953	2000: + 19 MW
Vuhred	3		60	1956	2004
Ožbalt	3		60	1960	2004
Zlatoličje	2		123	1968	2004
	1		1	1989	2004
Formin	2		112	1978	
Sava River	13		128		
Moste	1		25	1978	
Medvode	2		23	1953	
Mavčiče	2		38	1986	
Vrhovo	3		32	1993	
Soča river	36		99		
Solkan	3		31	1984	
Doblar	3		30	1939	2000
Plave	2		15	1940	2000
Ajba	1		4	1975	
Total	**139**		**2,417**		

There is in fact only one large municipal cogeneration plant - TETOL (mentioned already as large electricity producer) - situated in Ljubljana, which is producing about 4 % of the total electricity generation in the country. However this is not an ”usual” cogeneration but indeed thermal power plant which is a part of state owned electricity generation, transmission and distribution system but is also supplying Ljubljana with heat.

Therefore its ownership is not clear yet and there is a dispute on the ownership share and competencies. between the city of Ljubljana and the state.

Industrial power plants/cogeneration plants cover about 3.5 % of the total generation capacity. The most important branches in this terms are paper mill and cellulose fabrics (more than half of the capacities), metallurgy, food industry, textile industry and wood industry.

2.5.6.1.2 Electricity transmission and distribution

The electricity transmission grid is operated by Elektro Slovenija – ELES which is owned by the state. The privatisation of the company has not yet started and there are no clear signs whether or not transmission company will be privatised at all

The electricity distribution grid is operated by Elektro Ljubljana - centre and south, Elektro Maribor - north east, Elektro Celje - eastern central, Elektro Primorska - west, Elektro Gorenjska - north west, which are all owned by the state. The privatisation of the companies has not yet started.

The new energy law, as confirmed in the Parliament on the second reading in July 1999 (the third and final reading is expected in September 1999) defines the opening of the electricity market in Slovenia in the following terms:

- free trading organised by a market organiser entity,
- regulated TPA to the transmission and distribution networks,
- distribution companies are to be eligible customers,
- all customers with connected power in excess of 41 kW are to become eligible customers.

The single-buyer concept is not employed.

Whereas there is only one step of market opening regarding the size of the customers allowed to chose the supplier (eligible customers), two steps are envisaged regarding the suppliers. From approximately January 1, 2001 only electricity produced within Slovenia will be freely traded. From January 1, 2003 free international trading will be allowed. (January 1, 2003 is the Slovenian target date for EU accession).

The electricity market will be opened in Slovenia more than is minimally required by the EU directive. It is estimated that the market opening will be 60 %. Otherwise, the concept of public service is applied. Operation of the electricity, transmission network and the operation of the distribution networks are all defined as public services. These services may be performed by public service companies or companies with concessions. It is expected that initially these functions will be performed by the public service company ELES (market operation and transmission network operation) and the five distribution companies. Distribution is also a national public service - municipalities have no say in electricity distribution.

An Agency for Energy (Agency) is to be established as an independent entity with the purpose of assuring a transparent and non-discriminatory operation of the electricity and gas markets in the interest of al parties involved. (Note: the Agency has no role in establishing prices for the captive customers, these will be set by the government).

The role of the Agency is principally to set the prices for transmission and distribution, and to issue Licences. Agency also resolves disputes (on the first level) regarding network access (electricity and gas) and regarding transmission and distribution pricing.

A problem with market opening in Slovenia will be electricity production from domestic coal. The cost of this production seems to be well in excess of competitive prices. The government is now estimating that the 'stranded investments', power plants that are not competitive, may have a nominal value of Euro 0.5 and 1 billion (similar level of stranded costs has been estimated for Austria, which several times larger). How this issue will be resolved has not yet been specified by the government.

2.5.6.2 District heating market

Heating plants are regularly owned by municipalities (60 %) and by local industrial companies (20 %) which are in most cases privatised or by local private companies (20 %). The district heating grids are regularly owned by public utilities which are normally owned by municipalities.

2.5.6.3 Gas market

Gas production is operated by Nafta Lendava. Nafta Lendava is a stock company which is owned by PETROL stock company (around 75 % of stock) and the state. The privatisation of the company has been completed. However the gas is used almost exclusively for the oil refinery in Lendava which is intended to be shut down by PETROL.

Gas imports and exports are managed by company GEOPLIN which is a stock company etc., owned by the state (24 %), PETROL TRADE (12 %) and about 160 small industrial shareholders. The privatisation of this companies has been completed.

The gas transmission grid is operated by company GEOPLIN which is a stock company etc., owned by the state (24 %), PETROL TRADE (12 %) and about 160 small industrial shareholders. The privatisation of the company has been completed.

The gas distribution grid is operated by 22 companies. The 8 largest companies cover around 75 % of total natural gas supplied at the level of distribution companies. Most of these companies are stock companies. Privatisation of 4 of these companies has already been completed. Privatisation of the other 4 companies has not been started.

2.5.6.4 Mineral Oil and Coal Market

Coal production is operated by Rudniki Rjavega Premoga Slovenije (Brown Coal Mines of Slovenia, which consists from company Rudnik Lignita Velenje (Velenje Lignite

Mine) and company Rudnik Trbovlje Hrastnik (Trbovlje Hrastnik Mine). Their sales are limited to supply of both neighbouring large power plants Termoelektrana Šoštanj I - V and Termoelektrarna Trbovlje II. Company Rudniki Rjavega Premoga is a joint stock company which is owned by the state. The privatisation of the company has not yet started.

2.5.6.5 Development of Prices

Energy prices are available for the years 1994 and 1997 only (in some cases for 1996 too). However, there are two remarkable trends in energy prices. Prices for electricity and fuel oil increased between 1994 and 1997 whereas prices for natural gas and heat declined. The detailed pictures is as follows:

- The electricity price for residential purposes increased by 17% between 1994 and 1997. For industrial purposes the electricity price increase was only 8%.
- The price of fuel oil was identical for all sectors in increased homogeneously by 10% between 1994 and 1997.
- Natural gas prices decreased substantially; for residential purposes it decreased by almost a quarter (-24%); the price of natural gas for industrial purposes was roughly 50% below the prices for residential uses; however, gas prices for industry decreased too by 15%.
- Heat prices for residential purposes declined by 12% between 1994 and 1997.

2.5.7 Energy and the Environment

2.5.7.1 Greenhouse Gas Emissions

Greenhouse gas emissions (three gas basket) went down between 1990 and 1992 from about 19.2 to 17.7 million tons of greenhouse gas equivalent (GHGE). This corresponds to a decline by 8%. Since 1993 GHG emissions started to increase again to about 19.5 million t GHGE in 1996, which is 2% above the 1990 levels. Almost three quarters (71%) of the GHG emissions derive from fuel combustion, 12% from agriculture.

With regard to the individual greenhouse gases the development is as follows: 73% of the GHG emissions are CO_2 emissions. The share of Methane (CH_4) was almost a fifth (19%). The remaining 8% of GHG emissions are N_2O emissions.

Nearly than 10 t GHGE have been emitted per capita in 1990. This was 16% below the EU average (11.5 t GHGE/Cap.). Parallel to the absolute emissions the per capita emissions decreased only slightly until 1992 but increased again hereafter. In 1996 they are already 2% above the level of 1990 and merely 10% below the EU average which decreased by 6%.

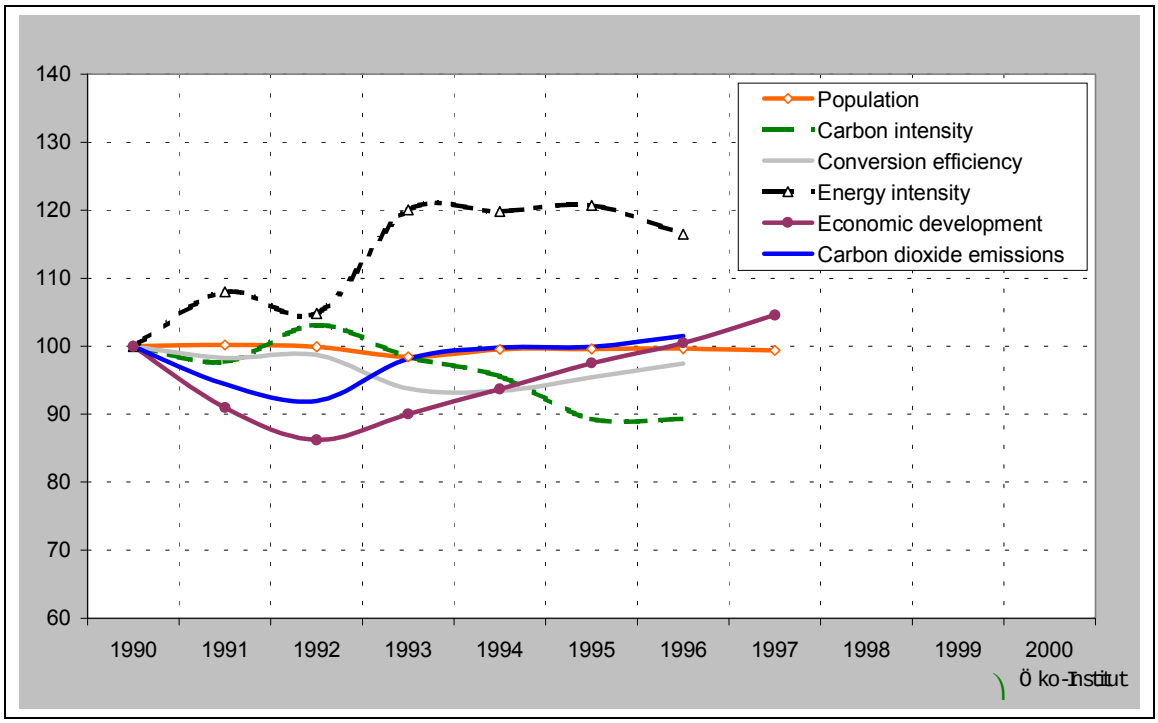
The carbon intensity – calculated by the ratio of overall GHG emissions to GDP at 1995 real PPP – did not change much during the nineties. Due to the economic decline it rose

between 1990 and 1994 (+11%) but went then down until 1996 to the level of 1990 (0.9 kg/US$). However, the carbon intensity of the Slovenian economy was in 1990 37% above the EU average. Due to decreasing carbon intensity in the EU the carbon intensity gab widened to 58% above the EU average in 1996.

2.5.7.2 Driving forces

The following figure shows five key factors (forces) that influence the development of CO_2 emissions (compare 2.1.7.2).

Figure 6: Driving Forces of Slovenia's CO_2 emissions



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Obviously population growth did not influence the development of CO_2 emissions in Slovenia because it did nearly not change during the nineties. Opposite to that the economic development did have a remarkable impact. The economic decline between 1990 and 1992 was mainly responsible for the decline of CO_2 emissions in Slovenia. The energy intensity of the Slovenian economy grew substantially and was in 1993 20% above the 1990 level. This increase was the main reason for the immediate increase of CO_2 emissions after the bottom of the economic decline in 1992. Due to the decreasing carbon intensity of the Slovenian energy supply Slovenian CO_2 emissions did not increase

after 1993 although the economy grew constantly. The conversion efficiency[3] did not change much. It was slightly below the 1990 level. Efforts to improve the conversion efficiency further and to reduce the energy intensity could be points of departure for a greenhouse gas mitigation strategy.

2.6 Similarities and Differences

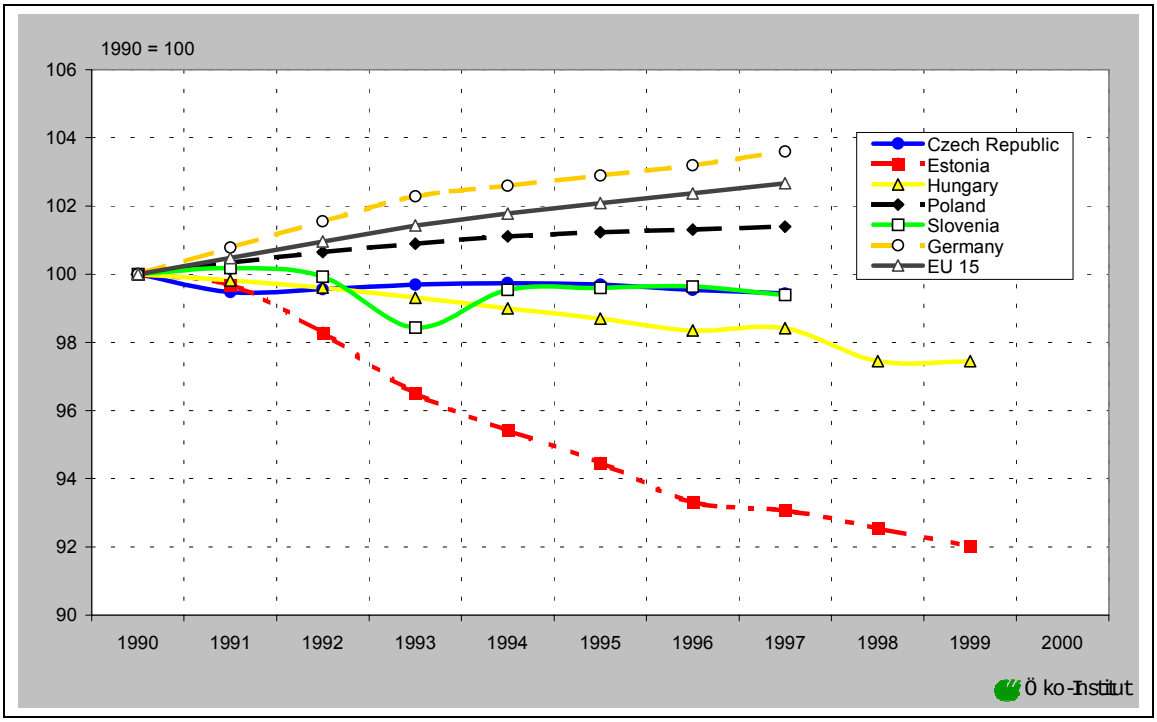
After highlighting the different characteristics of each accession countries their similarities and differences should be stressed. The aim of this analysis is to identify the specific problems and points to start an adequate and efficient strategy for CO_2 mitigation. Therefore we focus the analysis on the driving forces for the development of CO_2 emissions which are the development of

- population,
- Gross Domestic Product,
- carbon intensity,
- conversion efficiency and
- energy efficiency.

Population did not change much during the nineties (Figure 7). Apart form Estonia changes were below 3%. Population grew in the EU, in Germany and in Poland and remained nearly constant in Czech Republic and Slovenia. Opposite to that population shrank in Hungary (-2%) and substantially in Estonia (-8%). However, as changes in population were in general very low these changes could not be considered as driving forces for the development of CO_2 emissions.

[3] Due to the definition of the conversion efficiency as TPES/TFC the indicator increases if the efficiency declines which corresponds to a increasing line.

Figure 7: Population

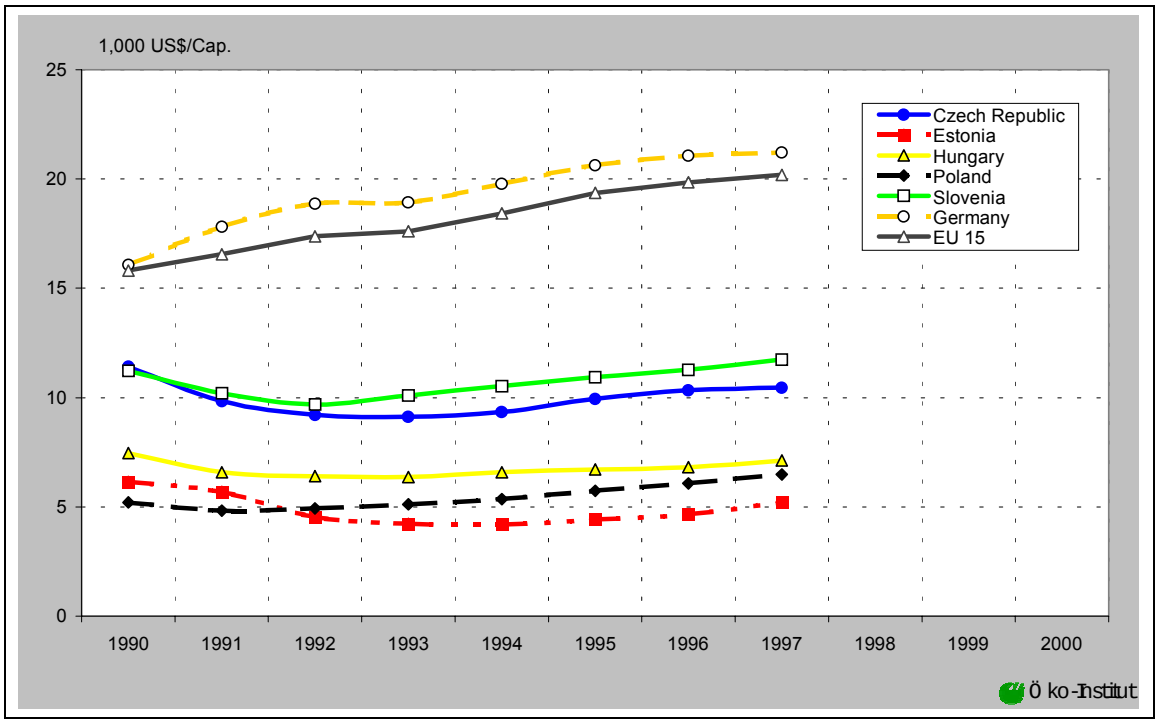


Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Gross Domestic Product (GDP) per Capita is in the Accession Countries substantially lower than in the EU. Slovenia's and Czech Republic's GDP per Capita is higher than the other Accession Countries' GDP per capita. In Estonia, Hungary and Poland it is less than half of the EU average. With regard to the development during the nineties the picture is as follows:

- GDP per Capita grew in the EU by +28%.
- All Accession Countries had decreasing GDP per Capita in the first years of the nineties.
- Poland was the first country that started to grow again in 1992; Estonia was the last country (1995).
- GDP per capita was in 1997 above the 1990 level only in Poland (25%) and Slovenia (5%); in Czech Republic, Estonia and Hungary it was still substantially below the 1990 level.

Figure 8: Gross Domestic Product per Capita



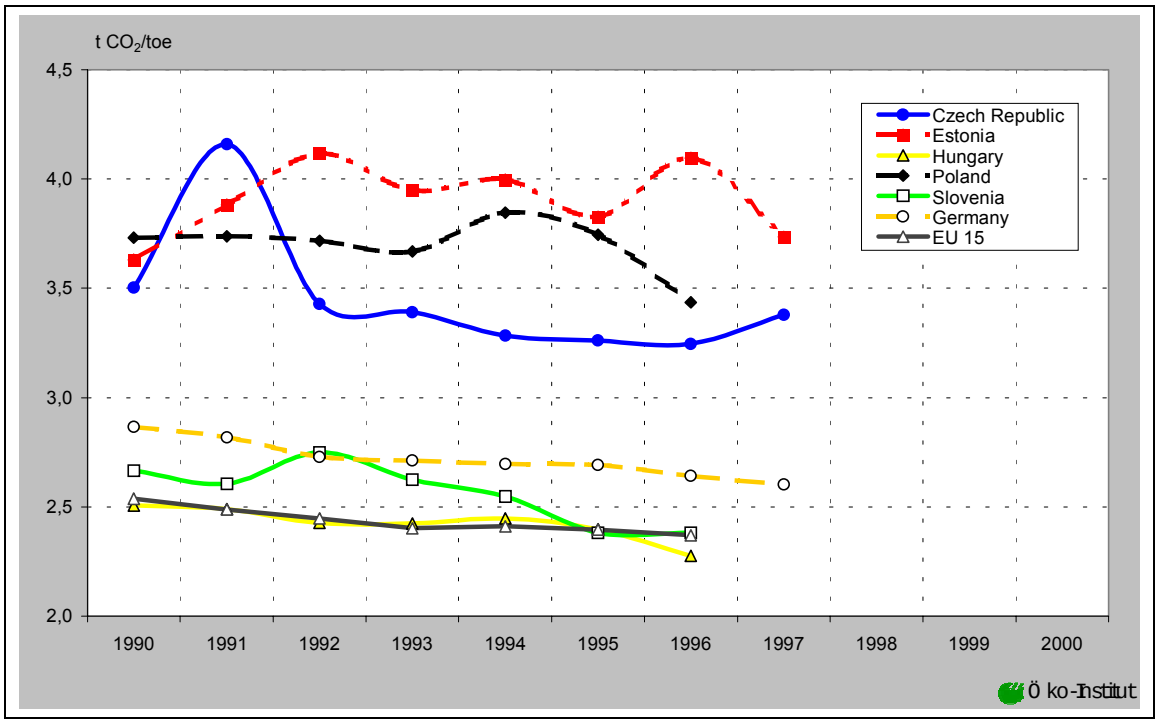
Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Changes in GDP per Capita were substantially in all Accession Countries. The downturn was most dramatically in Estonia (-35%). Correspondingly economic development one of the most important driving forces for the development of CO_2 emissions during the nineties. Economic recession contributed in all Accession Countries to declining CO_2 emissions. However, in some cases the impacts of economic development were partly compensated by other influencing factors.

The carbon intensity is defined as t CO_2 emissions per unit of TPES. Carbon intensity of Czech Republic, Estonia and Poland is significantly higher than the EU average whereas carbon intensity of Hungary and Slovenia is more or less comparable to the EU average (Figure 9). Opposite to the latter countries Czech Republic, Estonia and Poland do have considerable amounts of fossil resources which have been used domestically and, thus, determined the technical development of the domestic energy system (power plants etc.).[4] As these resources are solid fuels (coal respectively oil shale) with a high carbon content these countries have higher carbon intensity. A second reason for the lower values in Estonia and Hungary is the substantial share of nuclear power stations (Hungary, Slovenia) and hydro power stations (Slovenia) in electricity generation.

[4] Solid fuels are the most important fuel in Czech Republic, Estonia and Poland. In 1990 solid fuels accounted for 62% of TPES in Czech Republic and Estonia and for 74% of TPES in Poland. In Estonia the share went up to 75% in 1997 but went down to 52% of TPES in Czech Republic and to 70% in Poland.

Figure 9: Carbon Intensity

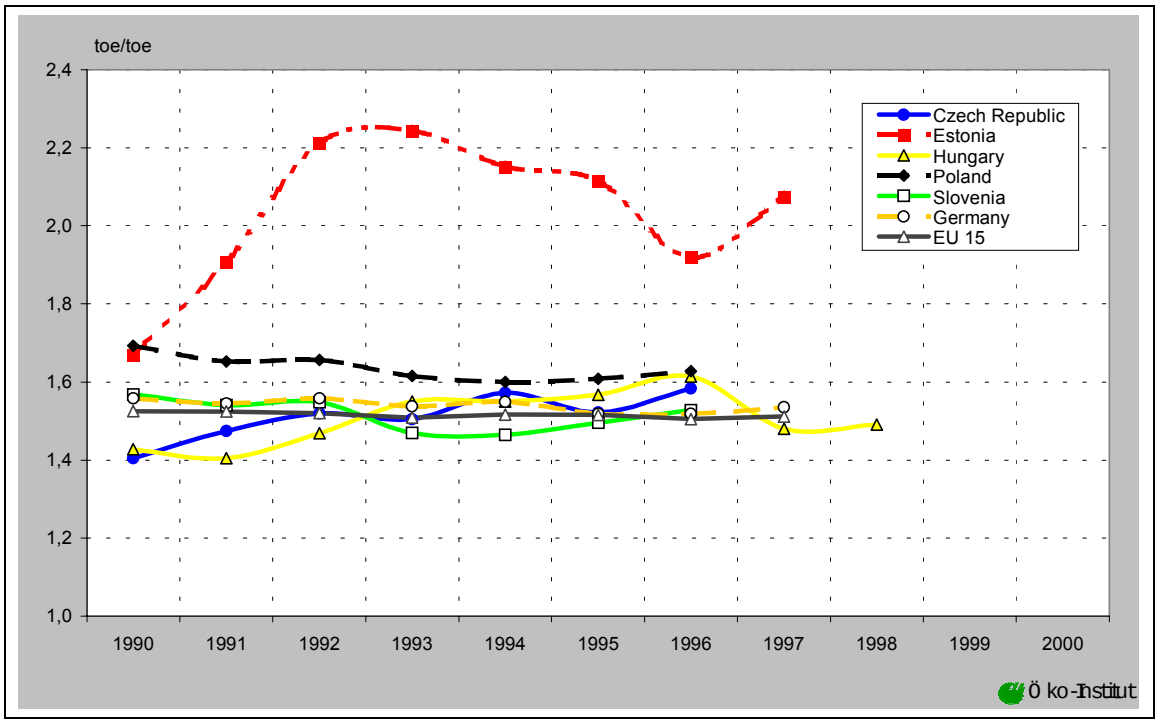


Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Carbon intensity was very volatile in did not follow a clear trend in most Accession Countries apart from Hungary. However, in 1996 respectively 1997 carbon intensity of Accession Countries was only 5 to 10% below the 1990 level apart from Estonia where it was slightly above the 1990 level. Hence policies and measures that aim to reduce carbon intensity (e.g. fuel shift to gas or renewables) would clearly contribute to a CO_2 mitigation strategy in particular in Estonia where carbon intensity did not decline during the nineties.

Conversion efficiency is defined as TPES per Total Final Consumption (TFC). In general conversion efficiency in Accession Countries does not deviate significantly from the EU average (Figure 10). At the beginning of the nineties Estonia's, Poland's and Slovenia's conversion efficiency where worse than the EU average whereas in Czech Republic and Hungary the conversion efficiency was better than the EU average. Apart from Estonia conversion efficiency did not change substantially during the nineties. In the EU it went down by merely 1% until 1997. In Poland and Slovenia it was slightly improved (-3 respectively –4%) until 1996. In Hungary it worsened slightly and was 1997 only little below the EU average. Czech Republic's conversion efficiency worsened substantially and was in 1996 clearly above the EU average. However, only in Estonia the changes in conversion efficiency were dramatically. In 1997 conversion efficiency was roughly 25% worse than at the beginning of the nineties and more than one third (37%) worse than the EU average.

Figure 10: Conversion Efficiency

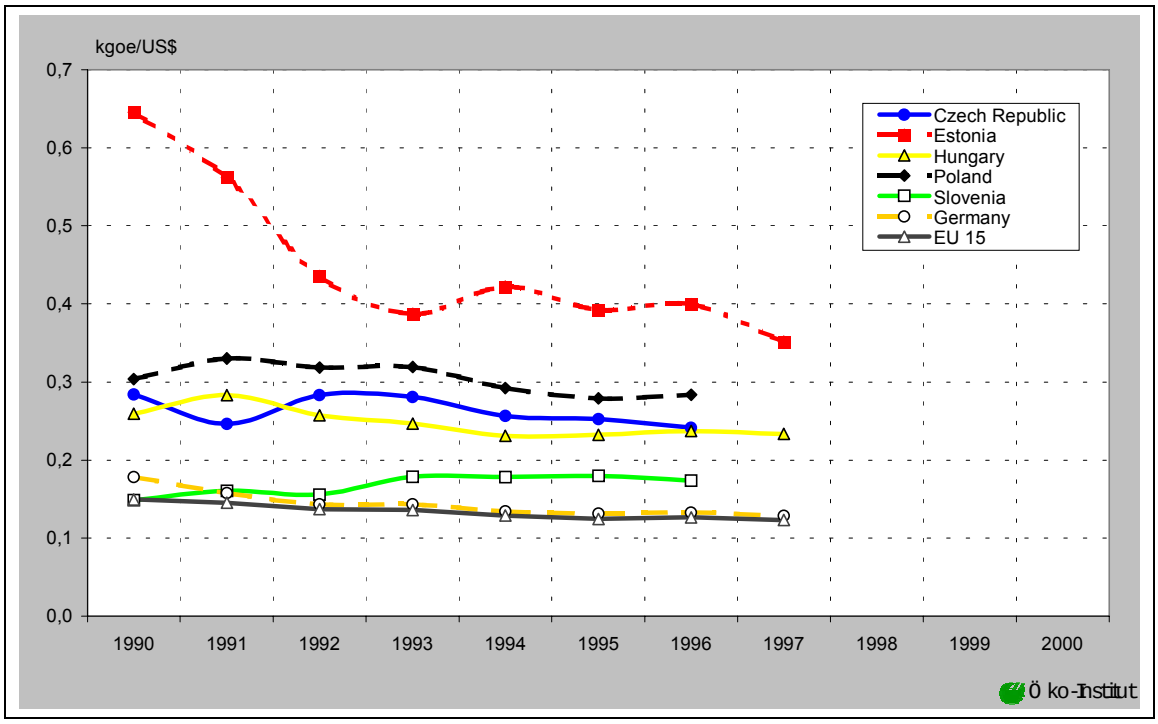


Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

Although conversion efficiency in Accession Countries is basically comparable with EU countries improvements in conversion efficiency should not be neglected. In particular in countries where conversion efficiency worsened during the nineties (Czech Republic, Hungry and in particular Estonia) policies and measures to improve conversion efficiency (e.g. reduction of electricity or heat losses) should gain a high priority.

The energy intensity is defined as unit of TFC per unit of GDP measured in 1995 USD at purchasing power parities. Energy intensity was in most Accession Countries substantially higher than the EU average (Figure 11). Only Slovenia's energy intensity was at the beginning of the nineties in the range of the EU average. However, it worsened during the subsequent years and was 1996 clearly above the EU average. Czech Republic's, Hungary's and Poland's energy intensity is some 100 to 200% above the EU average. Only Estonia's energy intensity was more than 300% above the EU average. However but it went down most of all Accession Countries (-45%) and was 'only' 200% above the EU level in 1997. Apart from Slovenia energy intensity improved in all other Accession Countries between 7 and 15%. But due to higher improvement in energy intensity in the EU the gap to between EU and Accession Countries widened during the nineties.

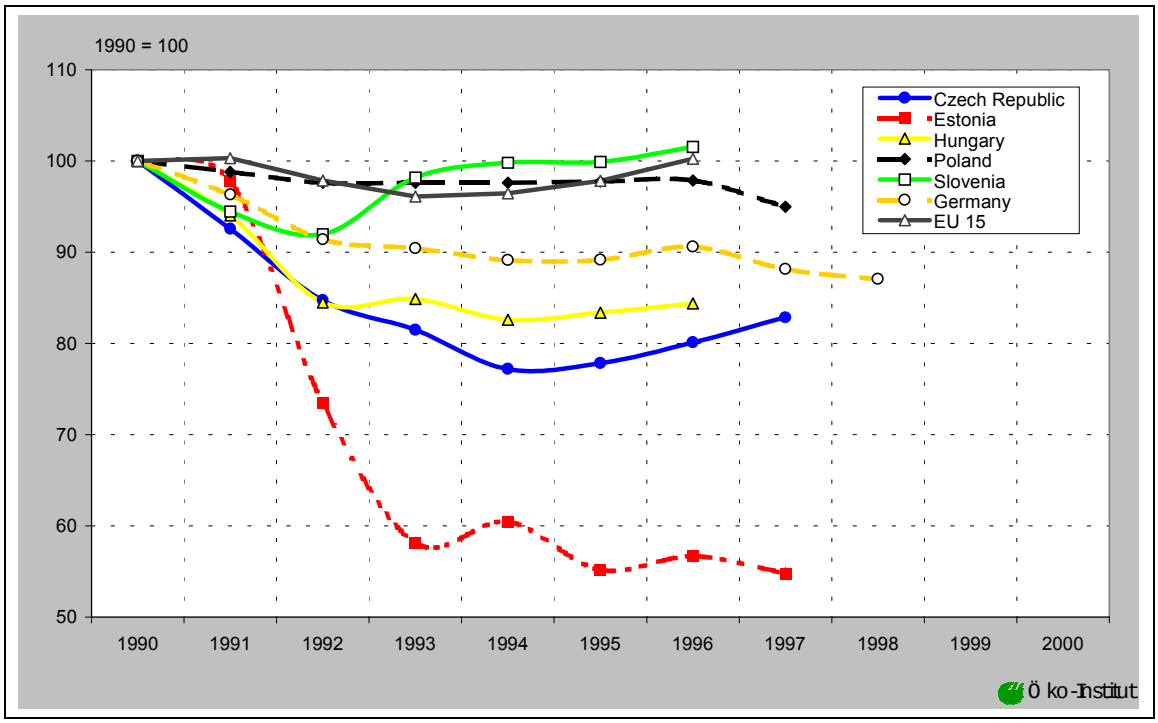
Figure 11: Energy Intensity



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

As energy intensity of the Accession Countries deviates still dramatically from the EU average policies and measures to improve energy intensity (e.g. efficiency improvements on the demand side) should gain a high priority. This applies to Czech Republic, Estonia, Hungary and Poland where energy intensity is substantially higher than the EU average as well as to Slovenia where energy intensity did not improve but worsen during the nineties.

Figure 12: Development of CO_2 Emissions



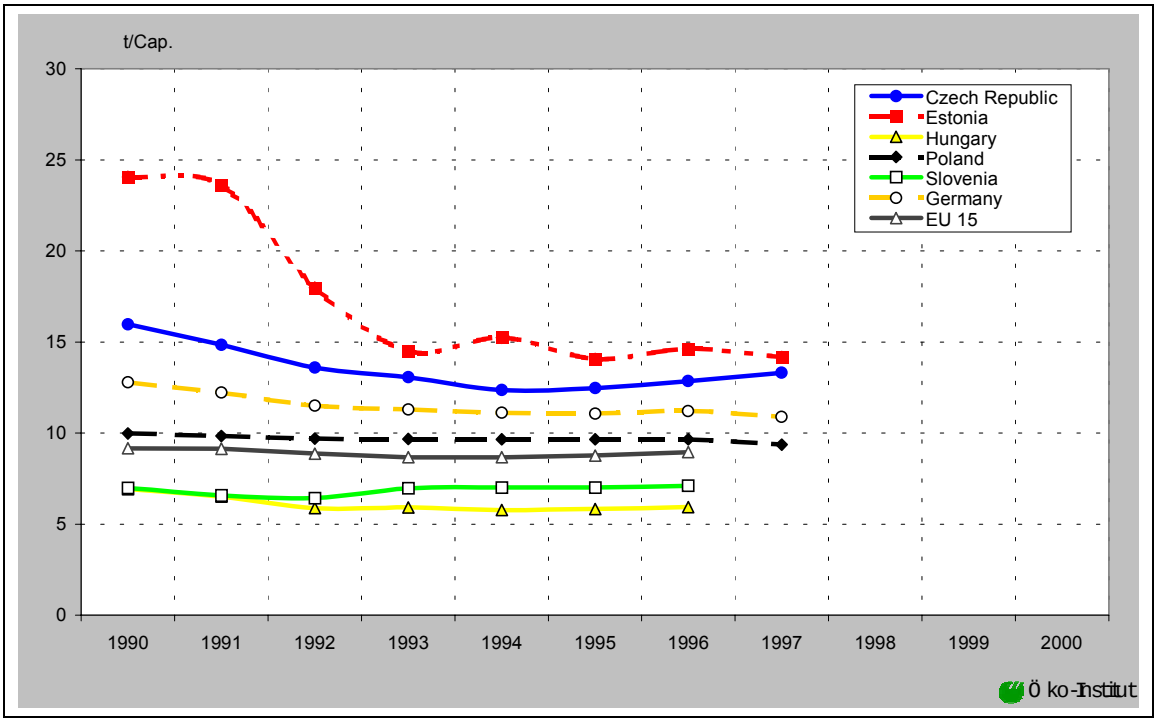
Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

The resulting developments of CO_2 emissions were as follows (Figure 12):

- In Czech Republic, Estonia and Hungary CO_2 emissions went down substantially.
- In Poland CO_2 emissions decreased by 5% until 1997 despite substantial economic growth; this was only possible through an improvement of all driving forces (carbon intensity, conversion efficiency, energy intensity).
- Slovenia's CO_2 emissions were slightly above the 1990 level; the main reasons for this development are that Slovenia was less effected than Czech Republic, Estonia and Hungary by economic recession and that energy intensity worsened during the nineties.
- In Estonia the dramatic economic decline as well as the improvements of the energy intensity determined the decline of CO_2 emissions by more than 40% between 1990 and 1993.
- Czech Republic's and Hungary's CO_2 emissions were initially most influenced by the economic decline; due to improvements in carbon and energy intensity they remained on the lower level when the economy started to grow again.

In absolute terms CO_2 emissions can be compared on a per capita bases (Figure 13). Hungary's and Slovenia's CO_2 emissions per capita are well below the EU average although Slovenia's 'CO_2 advantage' shrank during the nineties.

Figure 13: CO_2 Emissions per Capita



Source: DG XVII 1998, World Bank 1999, UNFCCC 1999, calculations by Oeko-Institut

CO_2 emissions per capita in Czech Republic, Estonia and Poland are above the EU average. However, Poland's CO_2 emissions are only slightly above the EU average and still below Germany's level. Czech Republic's and Estonia's CO_2 emissions per capita are substantially above the EU average although – in particular in Estonia – they went down significantly at the beginning of the nineties.

2.7 Conclusions

The analysis shows that there are several options and starting points for CO_2 mitigation strategies in all Accession Countries. However, some of them are more adequate in one country and others in another country. Therefore it should be highlighted where each country should focus on its CO_2 mitigation strategy:

- Czech Republic's carbon and energy intensity are significantly above the EU average; carbon intensity has been improved only by 5% during the nineties; although energy intensity went down almost 15% since 1993 it could be improved further.
- Estonia was most affected by economic recession due to the transformation process; its CO_2 emissions decreased substantially; however, carbon intensity was worse in 1997 than in 1990 and energy intensity did only decline between 1990 and 1993; since then it remained more or less on that level.

- Hungary's CO_2 emissions per capita are already substantially below the EU average; however, energy intensity is still almost twice as high as the EU average; when the economy continues to grow further improvements in energy intensity are necessary to avoid CO_2 emissions rises.
- Poland was least affected by economic recession during the nineties because it started the transformation process earlier in the eighties; despite remarkable economic growth CO_2 emissions did not increase; however, carbon and energy intensity are of the highest of all accession countries; improvements in energy intensity like the one achieved since mid of the nineties should be continued.
- Slovenia's CO_2 emissions are below the EU average; however, it was also the only Accession Country where CO_2 emissions increased during the nineties; improvements in carbon intensity have been over compensated by energy intensity deterioration; a Slovenian GHG mitigation strategies should therefore focus on the reduction of the energy intensity to its 1990 level.

In general the analysis has also shown, that economic development and energy intensity are the most important driving forces.[5] As economic development is a parameter not a variable for GHG mitigation policies energy intensity should have a key role in any GHG mitigation strategy. Influences of carbon intensity on the development of CO_2 emissions are substantially but lower than influences of energy intensity. The conversion efficiency seems to bee the least important driving force. Nevertheless, policies and measures to improve the conversion efficiency should not be neglected.

[5] Most countries show very similar patterned curves for energy intensity (Figure 11). and CO_2 emissions per capita (Figure 13). Influences of economic development on the development of CO_2 emissions are obvious in the Czech Republic (Figure 1), Estonia (Figure 2), Hungary (Figure 4) and Slovenia (Figure 6).

3 Analysis of the 'Acquis Communautaire'

Although the EC has no comprehensive energy policy, it has adopted a number of policy instruments relevant to the field of environment and energy. This field comprises environment-related regulations impacting the energy sector as well as energy-related regulations impacting the environment. As a precondition for becoming EC Member States, Estonia, Hungary, Poland, Slovenia and the Czech Republic will have to transpose and implement these regulations into their domestic legal systems.

The EC has various policy instruments at its disposal. *Regulations* are directly binding and applicable within all Member States, and they do not require implementing legislation in the Member States. However, they do not currently exist in the field of environment and energy. *Directives* are also binding on each Member State with regard to their objectives. The exact way of reaching those objectives, however, is left up to domestic legislators, who are required to implement the Directive. *Decisions* (of the Council) are binding in all their parts on those at whom they are directed. Programmes are usually adopted in the form of decisions. The accession candidates have to implement such binding instruments to the extent that they are applicable.

Recommendations, *communications* and *strategy papers* (including Green and White Papers) are not legally binding, but rather an expression of the current state of discussion on specific issues in the EC. They frequently point the direction of future policy development. Accession candidates may benefit from taking these into account in order to be able to adapt flexibly to new policy developments that may occur in the future.

Finally, *environmental agreements* (also called voluntary or negotiated agreements) are a relatively new instrument of EC policy. Formally, these are inter-industry agreements approved in some way by the European Commission and the Member States. Based on the understanding that such agreements will suffice to avoid future legislation on the specific issue in question, industry agrees to obtain certain standards. While no formal legal requirements arise from these agreements, political pressure is bound to occur and call on relevant industries of the accession countries (where they exist) join the pre-existing environmental agreements.

With the date of accession the entire set of European legislation will be applicable for the Accession Countries obliging them to fulfil the specific requirements of the different pieces of legislation. The deadlines mentioned in the Directives to transpose and implement the legislation is of course not applicable any more to the Accession Countries. This may not exclude the possibility of the postponement of the date of implementation of certain requirements of specific Directives during the Accession negotiations. It is possible that for the Directives for which the transposition deadline has, at the time of the accession not been expired yet, special deadlines for the Accession Countries will be laid out.

Some Directive set a specific threshold for every Member State to fulfil. For the Accession Countries these thresholds will be negotiated or calculated individually during the accession negotiations.

The following paper will give an overview of existing European legislation and policies in the field of environment and energy. We first introduce the existing Directives and related new proposals (section 2) and Decisions and Programmes (section 3) in the field of environment and energy. Particular attention is paid to the substantive, institutional-administrative, procedural and monitoring and reporting requirements. Subsequently, we deal with environmental agreements (section 4), the relevant more general policies and future strategies (section 5) and two concrete planned/proposed regulations (section 6). We conclude the paper by outlining briefly the elements of a country-specific analysis that identifies existing implementation gaps and the general prospects for approximating EC policies on environment and energy (section 7).

3.1 Directives (existing and proposed)

Although the European Legislation leaves a great deal of freedom to the Member States in transposing and implementing Directives, certain requirements must be fulfilled. These requirements indicate how the objectives of the Directive are to be achieved. They can be differentiated into four categories (objectives/substantive requirements, institutional, procedural and monitoring and reporting). Each Directive will be described according to these categories. Under the first section objectives will be laid out. Sometimes these objectives are translated into specific standards to be met by the EC Member States. Under the second heading the specific institutional requirements of the Directives are outlined. In most of the cases, the Directives presuppose the existence of a well-functioning administrative structure capable of implementing the Directive. However, some Directives explicitly require the designation of a specific authority or body to fulfil special tasks. The next heading 'Procedural Requirements' stresses the obligations of the Member States (and Accession Countries) to introduce definite procedures such as authorisation or tendering procedures. Sometimes the Directives leave the choice between different systems up to the Member States, but general criteria are laid down in the Directive and must be observed. The next heading 'Monitoring and Reporting Requirements' addresses the requirements of the Directives which oblige the Member States, for example, to regularly monitor that the stipulations of the Directive are fulfilled. Monitoring requirements can also apply in a narrow sense, for example, the monitoring of plant emissions or the energy efficiency of appliances.

The description of the Directives with regard to the obligations of the Member States to lawfully transpose and implement the European Legislation is restricted by the scope of this study. The aim of this section is thus to extract and to outline the most important and relevant requirements. However, in order to undertake an assessment of the legal gaps between European and national legislation, the careful study of each individual piece of legislation might be needed.

3.1.1 Liberalisation of the Electricity Market

3.1.1.1 Objectives/Substantive Requirements

The **Directive concerning common rules for the internal market in electricity (96/92/EC)** aims towards a competitive market in electricity. For achieving this objective, the Directive establishes common rules for the generation, transmission and distribution of electricity as well as for the organisation and functioning of the electricity sector and the access to the market.

The Directive regulates the operation of the transmission system and of the distribution system. Transmission means the transport of electricity on the high-voltage interconnected system to the final customer or the distributor whereas the distribution means the transport of electricity on a medium- or low-voltage distribution system to the final customers.

The production of electricity must be open to independent producers and so called autoproducers (natural or legal persons generating electricity essentially for their own use). The aim of the Directive on electricity is to liberalise the electricity market based on a phased approach. The share of market open to independent or autoproducers is laid down for each Member State. The Community will increase progressively the share of the national market over a period of six years.

Member States are obliged to bring into force the laws, regulations and administrative provisions necessary to comply with the Directive no later than 19 February 1999.

In 2005 the Commission will review the application of the Electricity Directive in order to allow the Council and the European Parliament to consider, in the light of the experience gained, a wider opening of the market.

3.1.1.2 Institutional Requirements

For the **construction of new generation capacity**, Member States must choose between an authorisation procedure and a tendering procedure. This presupposes the existence of authorities responsible for the authorisation and the tendering procedures. Member States which have opted for the tendering procedure have to designate an authority, a public or private body independent of the electricity generation, transmission and distribution activities, which is responsible for the organisation, monitoring and control of the tendering procedure. Also for the purpose of the tendering procedure Member States have to designate a competent body to draw up an inventory of new means of production, including replacement capacity (Art.6).

Concerning the operation of the **transmission system**, Member States shall designate or shall require undertakings which are in possession of their own transmission systems to designate a system operator who is responsible for operating and ensuring the maintenance of the transmission system in order to guarantee the security of supply (Art.7).

With the designation of a system operator for the transmission system, the Member States remain responsible for the development and publishing of technical rules, establishing for example minimum technical design and operational requirements for the connection to the system of generating installations (Art.7, 8, 9).

As well as for the transmission systems Member States have to designate a systems operator for the **distribution system**, which shall be responsible for the operation, maintenance and development of the distribution system. The system operator has to provide information to operators of interconnected systems so as to ensure a secure supply of electricity. Furthermore, the system operator will be responsible for the dispatching of generating installations.

Member States have the overall responsibility that the operation of the distribution system functions according to the provisions laid down in the directive. The designated distribution companies have to ensure that the distribution system in their area is secure, reliable and efficient, and that it operates with due regard for the environment. The Member State may require the distribution system operator or the transmission system operator when dispatching generating installations, to give priority to generating installations using renewable energy sources or waste or producing combined heat and power (Art.10, 11, 12).

Additionally, Member States are required to designate an authority to settle disputes on negotiations and refusals of access to the systems (Art.20 para.3).

3.1.1.3 Procedural Requirements

The Directive lays down specific procedures for the construction of new generation capacity, the operation of the transmission system, the operation of the distribution system, as well as principles for access to these systems.

View to the **construction of new generation capacity**, Member States have the right to choose between an authorisation and a tendering procedure. The criteria for the granting of *authorisations* are laid down in the Directive and shall relate to the safety and security of the electricity system, the protection of the environment, land use and siting, the nature of the primary energy sources, or energy efficiency. The criteria and details of the procedures have to be made public. In case of the refusal of an authorisation, the applicant must be granted the right to refer to an appeal procedure (Art.5).

When a Member State opts for the *tendering* system, the Member States have to ensure that the tenders have to be published in the Official Journal of the European Commission 6 months before the closure of the tender (Art.6).

For the organisation of **access to the transmission or the distribution system**, Member States may choose between procedures of negotiated access, the regulated or the single buyer system. In the first case, Member States shall take the necessary measures to ensure that electricity producers, suppliers and eligible customers are able to *negotiate*

access to the system and to conclude supply contracts with each other on the basis of voluntary commercial agreements (Art.17 para.2).

Member States may also opt for a *regulated system* of access procedure, giving eligible customers a right of access on the basis of published tariffs for the use of transmission and distribution systems.

In the case of the *single buyer system*, Member States shall designate a legal person to be the single buyer within the territory covered by the system operator. Member States shall take the necessary measures to ensure that the tariffs are published and that eligible customers are free to conclude supply contracts with supply undertakings outside the territory covered by the system or with producers inside the territory. Member States also have to ensure that independent producers are able to negotiate access to the system with the transmission and distribution systems operators so as to conclude supply contracts with eligible customers outside the system on the basis of a voluntary commercial agreement (Art. 18 para. iv).

3.1.1.4 Monitoring and Reporting

Member States shall create appropriate and efficient mechanisms for regulation, control and transparency, so as to avoid any abuse of dominant market position or predatory behaviour, in particular to the detriment of consumers (96/62/EC, Art.22; the same is applicable for the Gas Directive 98/30/EC Art.22).

The technical rules required by both Directives to ensure the interoperability of the systems shall be notified to the Commission in accordance with Art. 8 of the Directive 83/189/EEC laying down a procedure for the provision of information in the field of technical standards and regulations (96/62/EC, Art.7; 98/30/EC Art.5).

In the Directive on electricity, it is stipulated that contracts concluded on a negotiated basis and within in the framework of the single buyer system have to be notified to the Commission on an annual basis.

3.1.1.5 Transitional Provisions

Those Member States, in which commitments of guarantees of operation were given before the entry into force of this Directive and may not be honoured on account of the provisions of this Directive, may petition for a transitional regime which may be granted to them by the Commission.

3.1.2 Liberalisation of the Gas Market

3.1.2.1 Objectives/Substantive Requirements

The *Directive concerning common rules for the internal market in natural gas (98/30/EC)* aim towards a competitive market in natural gas. The structure and content

of this Directive is comparable to the electricity Directive described above. Some repetitions are however unavoidable. The Gas Directive establishes common rules for the transmission, distribution, supply and storage of natural gas.

Comparable to the Directive on electricity, the objective of the Gas Directive is to open the internal market in natural gas in several phases. The market shall be open to so called "eligible customers". *Eligible customers* are those entities to which natural gas can be sold according to the above mentioned procedures. The Member States define which customers with legal capacity are to be designated eligible customers. At the very least, gas-fired power generators, irrespective of their annual consumption, and other final customers consuming more than 25 million cubic metres of gas per year on a consumption-site basis must be designated as eligible customers. Member States shall ensure that the definition of eligible customers results in an opening of the market equal to at least 20 % (to 38 % in 2003 and 43 % in 2008) of the total annual gas consumption of the national gas market. The minimum consumption level for designating final customers as eligible shall be reduced in the year 2003 to at most 15 million cubic metres per year and to 5 million cubic metres in 2008.

Member States shall ensure that the *distribution* undertakings act in accordance with the Gas Directive. Each distribution undertaking shall operate, maintain and develop under economic conditions a secure, reliable and efficient system with due regard to the environment (Art.10).

Member States are obliged to bring into force the laws, regulations and administrative provisions necessary to comply with the Gas Directive, no later than 10 August 2000.

In 2008 the Commission will review the application of the Gas Directive in order to allow the Council and the European Parliament to consider, in the light of the experience gained, a wider opening of the market.

3.1.2.2 Institutional Requirements

Member States may require an authorisation for the *construction or operation* of natural gas facilities or the *supply* of natural gas and for *wholesale customers*. If an authorisation is required, the Member State or a competent authority must be responsible for the authorisation (Art.4).

Additionally Member States have to designate an authority responsible for the settlement of disputes on negotiations on the access to the systems and on the refusal of access (Art. 21 para.2).

3.1.2.3 Procedural Requirements

Member States must lay down the criteria and procedures for the granting of the above mentioned authorisation and shall make them public. Any refusal of authorisation requires that the applicant and the Commission be informed of the reasons for such refusals (Art.4). Member States shall ensure that technical rules establishing the minimum

technical design and operational requirements for the connection to the system of LNG facilities (liquefied natural gas), storage facilities, other transmission or distribution systems, and direct lines are developed and made available. These technical rules shall ensure the interoperatibility of systems and shall be objective and non-discriminatory.

For the organisation of the *access to the system*, Member States may chose either the negotiated access or regulated access procedure, or both.

In the case of *negotiated access*, Member States shall take the necessary measures for natural gas undertakings and eligible customers to be able to negotiate access to the system so as to conclude supply contracts with each other on the basis of voluntary agreements (Art.15).

In case of the *regulated access*, Member States are obliged to grant natural gas undertakings and eligible customers a right of access to the system, on the basis of published tariffs and/or other terms and obligations for use of that system (Art.16).

3.1.2.4 Monitoring and Reporting

Member States shall publish every year the criteria for the definition of eligible customers and send these criteria to the Commission to be published in the Official Journal of the European Communities.

See Electricity Directive

3.1.3 Energy Taxation

3.1.3.1 Objectives/Substantive requirements

The Directive 92/81/EEC on the harmonisation of the structures of excise duties on mineral oils, together with Directives 92/12/EEC and 92/82/EEC, regulates the taxation of mineral oils. Whereas Directive 92/12/EEC lays down provisions on the general arrangements for products subject to excise duties, Directive 92/82/EEC covers provisions with respect to the minimum rates of excise duty applicable to certain mineral oils like leaded or unleaded petrol, gas oil, heavy fuel oil or kerosene. The different types of mineral oils are all specified according to a Combined Nomenclature code. For these mineral oils, the Directive lays down minimum rates.

The most significant characteristics of the new *Proposal for a Council Directive restructuring the Community framework for the taxation of energy products* (COM(97)30) are (1) the expansion of required minimum levels of taxation to include all energy products, including mineral oils, natural gas, solid energy products (coal) and electricity, and (2) the gradual increase in these levels of taxation. If the proposed Directive is adopted, it will replace the existing Directives 92/81/EEC and 92/82/EEC.

Table 8: Actual and proposed minimum levels of taxation for energy products

Energyproduct	**Minimum taxation**			
	actual	1st phase (1998)	2nd phase (2000)	Goal (2002)
Petrol (ECU/1000 l)	287	417	450	500
Gas Oil (ECU/1000 l	245	310	343	393
Liquid Petroleum Gas (ECU/1000 kg)	100	141	174	224
Kerosene (ECU/1000 l)	245	310	343	393
Electricity (ECU/MWh)	–	1	2	3
Solid energy products (ECU/GJ)	–	0,2	0,45	0,7

remark: COM(97) 30 final.; European Commission 1996b: 48; this table does not contain all of the planned minimum levels of taxation; for the use of kerosene exceptions are laid down.

For mineral oils covered by the Directive 92/82/EEC, Member States are obliged to fix their rates at a level no less than the minimum rates prescribed in this Directive. Mineral oils other than those for which a level of duty is specified in the rules of Directive 92/82/EEC, shall, according to Directive 92/81/EEC, be subject to an excise duty if intended for use, offered for sale, or used as *heating fuel or motor fuel*. The rate of the duty to be charged shall be fixed, according to use, at the rate for the equivalent heating fuel or motor fuel (Art. 2 para. 2).

The Proposal for a Council Directive restructuring the Community framework for the taxation of energy products stipulates that, with respect to all energy products (with the exception of electricity), only use as *heating or energy materials* is to be subject to these minimum levels of taxation, and not use as raw materials. In the case of electricity, the minimum level of taxation is to be paid by the final consumer. The minimum taxation levels are to be differentiated according to use of the energy products (1) as energetic materials, (2) for special industrial and commercial uses (e.g. agriculture or construction), or (3) as heating materials. Certain energy-intensive branches of industry are to be exempted from the obligatory taxes. In order to achieve the prescribed minimum levels of taxation, Member States are allowed to calculate all indirect taxes which apply to the product in question. The Member States can continue to tax the various energy products differently, as long as the agreed-upon minimum taxation levels are achieved. In addition, the proposed Directive provides the opportunity to lower the tax burden in other areas (such as workplace taxes) in response to possible tax increases resulting from the directive. The current minimum taxation levels are to be increased every two years until the target levels of taxation stipulated by the draft directive for the year 2002 are achieved.

3.1.3.2 Institutional Requirements

In order to fulfil the obligations of the Directive on the harmonisation of the structures of excise duties on mineral oils, a tax authority has to exist in each Member State to ensure that excise duties are charged and taxes are collected.

The proposed Directive on the taxation of energy products does not require other institutional innovations than those stipulated by previous Directives.

3.1.3.3 Procedural Requirements

There are no specific procedural requirements

3.1.3.4 Monitoring and Reporting

Competent Authorities have to monitor the charge and collection of excise duties. Member States have to inform the Commission that laws, regulations and administrative provisions comply with the Directives 92/18/EEC, 92/81/EEC and 92/12 EEC.

According to the proposed Directive on taxation of energy products, Member States will have to inform the Commission of the levels of taxation which they apply. In particular Member States must inform the Commission of the measures and conditions adopted to ensure tax neutrality, i.e. avoiding an increase in the overall tax burden (COM(97) 30 Art.22. para.1).

It is difficult to assess whether or not the proposal will be adopted in the near future. However there is a strong support an adoption of the proposed Directive within the timeframe of the Finnish Presidency.

3.1.4 Large Combustion Plant Directive (and proposed revision)

3.1.4.1 Objectives/Substantive requirements

The *Directive on the limitation of emissions of certain pollutants into the air from large combustion plants 88/609/EEC* (Large Combustion Plant Directive), aims to address the principle causes of acid rain by limiting emissions of sulphur dioxide (SO_2), nitrogen oxides (NO_x) and dust. The Directive applies to all combustion plants with a rated thermal input equal to or greater than 50 MW. The Directive is not applicable to plants making direct use of the products of combustion in manufacturing processes or plants powered by diesel, petrol or gas engines, or by gas turbines. The goal of the reduction of emissions is to be accomplished by means of a combination of provisions concerning total emissions from existing plants and strict emission limits on new plants. Existing plants are subject to total national emission limits with phased reductions and with different limits for each Member State. For new plants, emission limits applicable to individual authorisations are defined.

For each Member State, national ceilings for SO_2 and NO_X emissions were set according to gradual steps, laid out in Annex I (SO_2) and Annex II (NO_x). Member States had to draw up programmes for the phased reduction of total annual emission of these substances from *existing* plants (i.e. plants whose original operating license was granted before 1 July 1987). These programmes must include timetables and implementing procedures for ensuring that these reductions will comply with the ceilings.

In the Accession Countries, national emission reduction targets will have to be agreed upon with the European Union, and programmes will have to be set up for reducing annual emissions from existing combustion plants in order to achieve national emission reduction targets.

3.1.4.2 Institutional Requirements

Competent authorities for the licensing and monitoring systems, as well as the reporting obligations under the Directive must exist.

If the operation of a combustion plant is likely to affect the environment in another Member State, the Member State must ensure that the other Member State is consulted appropriately under Directive 85/337/EEC on the assessment of the environmental effects of certain public and private projects.

3.1.4.3 Procedural Requirements

The Directive presupposes the existence of a licensing system for the operation of all combustion plants.

In case of the construction or operation of new combustion plants (i.e. licensed on or after 1 July 1987), the competent authority must ensure that all licenses for these plants contain conditions relating to compliance with emission limits fixed in Annexes III to VII (Art.4), and establish discharge conditions (Art.10) as well as procedures relating to the malfunction or breakdown of the abatement equipment (Art.8).

3.1.4.4 Monitoring and Reporting

The competent authorities must undertake regular monitoring of the emissions from combustion plants covered by the Directive (Annex IX). Emissions from new plants of more than 300 MW must be measured on a 'continual basis', while those from other plants must be measured 'regularly', as approved by the competent authority.

The Directive requires an annual emission inventory of SO_2 and NO_X from existing plants to be established on a plant by plant basis for plants over 300 MW and refineries, and on an overall basis for other plants (Annex IX). The inventory is to be sent to the Commission. Total annual emissions of SO_2 and NO_X from new plants are also to be determined and sent to the Commission. Operators of combustion plants have to inform

the authorities of the results of the continuous measurements and scientific institutions must be approached to monitor on behalf of the government.

3.1.4.5 Recent Developments related to the Directive

In July 1998, the EC adopted a proposal (COM(98) 0415 final) to amend the Directive 88/609/EEC. The main feature of the new proposal is that it introduces *emission limits* twice as strict as those currently applicable. It limits emissions for three types of pollutant: sulphur dioxide, nitrogen oxides and dust. The new limits would be applicable for all new plants put into operation after 1 January 2000.The proposal enlarges the scope of the Directive to include gas turbines and sets *limit values for NO_X* emissions from such installations. The revision also encourages the use of combined heat and power generation in new large combustion plants and the use of biomass as a fuel.

3.1.5 SAVE Directive

3.1.5.1 Objectives/Substantive requirements

The *Directive 93/76/EEC to limit carbon dioxide (CO_2) emissions by improving energy efficiency (SAVE)* aims to get Member States to limit their emissions of CO_2.

3.1.5.2 Institutional requirements

The Member States shall ensure that authorities are available to enforce the programmes for each of the sectors mentioned above.

3.1.5.3 Procedural requirements

Member States are obliged to improve energy efficiency, particularly by drawing up and implementing programmes in specific policy areas. These areas are:

- Energy certification of building:

Such certification should include the description of the building's energy characteristics and provide prospective users with information on the building's energy efficiency (Art.2) and thus improve transparency of the property market and to encourage investment in energy savings.

- Billing of heating, air-conditioning and hot water costs calculated on the basis of actual consumption:

The costs have to be calculated on the basis of actual consumption. This will enable the cost of these services to be distributed among the users, dependent on the quantities of heat, cold and hot water consumed by each occupier. This is applicable to buildings or parts of buildings supplied by collective heating, air-conditioning and hot water installations. Occupants should be able to regulate their consumption (Art.3).

- Third party financing for energy efficiency investments in the public sector,

This essentially implies that the overall recovery of costs incurred in auditing, installation, operation, maintenance and financing services for an energy efficient investment is dependent on the level of energy saving (Art.4).

- Thermal insulation of new buildings,

These programmes should have a long term perspective and be based on standards set by the Member States with due consideration for climatic conditions and the intended use of the building (Art. 5).

- Regular inspection of boilers with an rated output of 15 KW or more:

The programmes have to contribute to an optimal performance of the installations from an environmental and energy point of view(Art.6).

- Energy audits of undertakings with high energy consumption:

The programmes have to improve efficiency and limit CO_2 emissions (Art.7). Energy audits, in particular for undertakings with high energy consumption, should be promoted to bring about significant improvements in energy efficiency in this sector.

The programmes can include laws, regulations, voluntary agreements, etc., and the scope of the programmes is to be determined by the Member States (Art. 8).

3.1.5.4 Monitoring and reporting

Member States are to inform the Commission about the provisions of national law and other measures adopted by them in the areas covered by the Directive (Art. 10).

Every two years, Member States must report the results of the implementation and the choices made in their programmes.

3.1.6 Directives on the Labelling of the Consumption of Energy

3.1.6.1 Objectives/Substantive requirements

The *Directive 92/75/EEC on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances*, along with its *Daughter Directives*, aims to bring about the harmonisation of national measures on the product publication, particularly with regard to product labelling and information on the energy consumption of a product, thus enabling the consumer to choose an energy efficient product. The Directive 92/75/EEC is a framework Directive laying out general rules on labelling and product information, whereas specific regulations are laid down in so called "implementing Directives" or "daughter Directives" of the framework Directive.

The appliances covered by this Directive are:

- refrigerators, freezers and their combinations (94/2/EC),
- washing machines (95/12/EC), dryers (95/13/EC), washer-dryers (96/60/EC),
- dishwashers (97/17/EC),
- ovens (79/531/EEC),
- lighting sources (98/11/EC),
- water heaters and hot water storage appliances (planned) and
- air conditioners (planned).

Details about what should be included in the daughter Directives are also established in this Directive (Art.12).

The framework Directive lays down general provisions, whereas the daughter Directives provide specific regulations for each appliance. The daughter Directives are adopted in a procedure laid down in Article 10 of the Directive taking into account the technical progress. The Commission is assisted by a committee composed of representatives of the Member States (Art.10).

According to the framework Directive, information about energy consumption and other relevant product information is to be available to the consumer of the product by means of a fiche and a label. These labels are to be placed on each household appliance intended for sale, hire, hire-purchase or display to end users. The Daughter Directives to this Directive define the details regarding labels for each appliance. There are additional provisions regarding labelling and product information, for example the location and language of the label (Art.4a). The Directive also includes a provision on how information is to be provided to a potential customer in the case of mail order products (Art.5).

The Member States shall have adopted the provisions necessary to comply with the Directive by July 1993.

3.1.6.2 Institutional requirements

As Member States are obliged to take the necessary measures to ensure that the provisions of this Directive are fulfilled, a competent authority might be established to ensure this obligation.

3.1.6.3 Procedural requirements

Under the Directive, the suppliers of these appliances are responsible for providing all labels and information regarding the product free of charge (Art.4b). Suppliers should also provide a product fiche, which is contained in all product brochures, and be responsible for the accuracy of the labels and fiches (Art.3). Moreover, to enable assessment of the accuracy of the labels and fiches , the supplier must maintain technical documentation on the description of the product, tests reports results of design calculations, etc.

(Art.2.3) and these must be available 5 years after a product has been manufactured (Art.2.4).

Member States must also introduce educational and promotional campaigns on energy consumption to encourage consumer awareness about responsible energy use (Art.7).

3.1.6.4 Monitoring and Reporting

The Member States shall communicate to the Commission the main provisions of the domestic law which they have adopted in the field covered by this Directive by June 1993.

The Daughter Directives:

Each of the Daughter Directives includes details about the labels and fiches in their Annexes.

Dates of enforcement:

Directive on energy labelling of household electric refrigerators, freezers and their combinations (94/2/EC) - adopt and publish the provisions of the Directive by 31 December 1994 and apply them by 1 January 1995.

Directive on energy labelling of household washing machines (95/12/EC) - adopt laws and regulations by 1 March 1996 and enforce these by 1 April 1996.

Directive on energy labelling of household electric tumble dryers (95/13/EC) - adopt laws and regulations by 1 March 1996 and enforce these by 1 April 1996.

Directive on energy labelling of household combined washer-dryers (96/60/EC) - adopt laws and regulations by 15 July 1997 and enforce these by 1 August 1997.

Directive on energy labelling of household dishwashers (97/17/EC) - adopt laws and regulations by 15 June 1998 and enforce these by 1 July 1998.

Directive applying to electric ovens (79/531/EEC) - enforced within 2 years of notification of the Directive.

Directive applying to energy labelling of household lamps (98/11/EC) of 27 January 1998 - adopt laws and regulations by 15 June 1999 and enforce these by 1 July 1999.

3.1.7 Directives on Energy Efficiency Requirements for Household Appliances

3.1.7.1 Objectives/Substantive requirements

The *Directive on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels (92/42/EEC)* and the *Directive on energy efficiency requirements for household electric refrigerators, freezers and combinations thereof (96/57/EC)* aim at increasing the energy efficiency of such appliances. Directive 92/42/EEC is applicable to all new hot water boilers fired by liquid or gaseous fuels with a rated output of no less

than 4kW and no more than 400kW. The Directive lists those boilers which are not controlled by the Directive (e.g. hot water boilers capable of being fired by different fuels including solid fuels, 92/42/EEC Art.3). Directive 96/57/EC is applicable to all new electric mains-operated household refrigerators, frozen food storage cabinets, food freezers, and combinations with a maximum allowable electricity consumption expressed in a linear function (Annex I of Dir. 96/57/EC Art.1).

Member States shall ensure that only those boilers and refrigerators which meet certain efficiency requirements or 'harmonised standards' are placed on the market. The Directive on hot-water boilers sets various parameters depending on the type of boiler (standard boiler, low temperature boiler or gas condensing boiler) (92/42/EEC Art.5.1).

Member States shall adopt and publish all laws, regulations and administrative provisions necessary to comply with the Directive on water boilers by January 1993 and apply those provisions one year later. In case of the refrigerators Directive, Member States were to adopt the legislation by 3 September 1997 and apply the provisions starting in 2000.

3.1.7.2 Institutional Requirements

According to Directive 92/42/EEC each Member State must appoint a responsible body for the verification of the compliance of the boilers with the efficiency requirements set out in Article 5.1. These bodies are responsible for the procedures laid out in the Directive, like the granting of the CE label (indicating compliance with Directive requirements, see below). The bodies must fulfil certain criteria (i.e. the body and the staff responsible for carrying out the verification tests may not be involved in the development of the appliances inspected).

3.1.7.3 Procedural Requirements

Member States may apply a system of labels with a defined symbol scheme (stars) to hot-water boilers with an efficiency superior to the requirements laid out in the Directive. Boilers and refrigeration appliances which comply with the harmonised standards for production and measurement and with the efficiency requirements of the Directive must bear the 'CE' marking, which indicates that the product fulfils the requirements of the Directives. The declaration of conformity proves that the boiler type has been examined in accordance with a special procedure laid down in Annex III of the Directive. A declaration of conformity also has to be attached. Appliances labelled with the 'CE' marking can then be placed on the market (92/42/EEC Art.7; 96/57/EC Art.5).

In the case of refrigerators and related appliances, Member States shall take the necessary measures that refrigerators can only be placed on the market if the electricity consumption is equal or less than the maximum allowable electricity consumption. Refrigerators are classified into categories and levels of maximum allowable electricity con-

sumption are laid down for each category. The procedure for calculating electricity consumption is laid out in Annex 1 of Directive 96/57/EC.

3.1.7.4 Monitoring and Reporting

A list of the bodies appointed (see 'Institutional Requirements') must be notified to the Commission and other Member States and be referred to as 'notified bodies' (92/42/EEC Art.8 Annex V).

The reference numbers of the boilers which comply with the harmonised standards have to be published in the Official Journal of the European Community and the boilers must be accompanied with the EC declaration of conformity.

Planned : A Directive on the energy efficiency requirements of commercial lamp circuits is currently being considered.

3.1.8 Directive on Integrated Pollution Prevention and Control

3.1.8.1 Objectives/Substantive requirements

The aim of the *Directive 96/61/EC concerning integrated pollution prevention and control (IPPC)* is to achieve integrated pollution prevention and control for specific industrial activities listed in Annex 1 of the Directive to ensure the protection of the environment taken as a whole. For this purpose, the Directive establishes measures for the prevention or reduction of emissions to air, water and land as well as waste generated from the listed industrial activities (Art.1). It obliges the operators to prevent pollution to these media. Amongst other obligations, they are also responsible for using energy efficiently (Art.3). The industries regulated by the IPPC Directive include energy industries such as certain combustion installations, mineral oil and gas refineries, coke ovens and coal gasification and liquefaction plants and other energy-consuming industries.

The provisions of the Directive must be transposed into national law in the EU Member States by October 1999, and will apply immediately to new installations (not installed before the entry into force of this Directive) covered by the Directive as well as to existing installations undergoing substantial modifications. Other existing installations have an eight-year transition period until the year 2007, when all the provisions of the Directive apply to these installations as well.

3.1.8.2 Institutional Requirements

The Directive presupposes that countries have developed administrative structures to issue environmental permits for industrial operations and scientific knowledge to administer and control regimes for the environmental management of a number of industrial sectors. The existence of a competent authority responsible for implementing the provisions of the Directive is required (Art.2). Where there is more than one competent

authority responsible for the granting of permits, Member States must ensure that the conditions and procedures for granting of permits are co-ordinated (Art.7).

3.1.8.3 Procedural Requirements

The key concept involved in the fulfilment of the obligations of the Directive is that of Best Available Techniques (BAT). The Directive lays down a framework requiring Member States to issue permits for the listed industrial activities. These permits must contain conditions based on BAT of pollution abatement. Techniques mean not only the technologies used, but also the way in which the installation is designed, built, maintained, operated and decommissioned. The Directive requires the European Commission to organise an exchange of information between Member States and the industries concerned on the BAT. The European IPPC Bureau organises this exchange of information and produces BAT Reference Documents (BREFs) which the competent authorities in the Member States will take into account in their determination of the most appropriate condition for a permit under the Directive. In addition to the requirements of BAT, the directive contains a list of 12 items to be considered when determining BAT requirements, for example the consumption and nature of raw materials used in the process and their energy efficiency (Annex IV no.9). The drafting procedure of the BREFs is expected to last until about the year 2002 after which they will be published by the Commission.

Under the Directive, all new and existing installations are to be subjected to a permitting regime which applies emission limits and other controls based on Best Available Techniques (BAT) standards and a multi-media approach. Permits granted must guarantee that the installations comply with the provisions of the Directive. If installations do not comply with the Directive, the competent authority must refuse to issue the permit (Art.8).

The permits must include emission limits values for pollutants, especially for those listed in Annex III of the Directive, likely to be emitted from the installation concerned in significant quantities, taking into account the nature of these emissions and their potential to transfer pollution from one medium to another. If necessary, the permit shall include appropriate requirements ensuring protection of the soil and ground water, and measures concerning the management of waste generated by the installation. If environmental quality standards require stricter conditions than what is achievable through the best available pollution abatement techniques, then additional measures must be included in the permit (Art.10).

When there is a possibility that the operation of an installation would lead to negative transboundary effects, the Member State where the permit was applied for must forward all relevant information to the affected Member State to comment on the permit before the competent authority takes a decision on the granting of the permit (Art. 17).

Public participation and the dissemination of public information are vital components of the Directive. The Member States must ensure that applications for permits are made available to the public with sufficient time for their comments, before the competent authority reaches its decision. The final decision, a copy of the permit and any updates must also be made available to the public (Art.15 para.1).

The competent authorities shall periodically reconsider and, where appropriate, update permit conditions of the installations.

3.1.8.4 Monitoring and Reporting

Authorities must regularly monitor whether or not the conditions of the permit are complied with by installation operators (Art.14).

The Member States are required to send the Commission every three years the available representative data on the limit values laid down by specific category of industrial activities and, if appropriate, the BAT from which those values are derived (Art.16).

In order to facilitate the exchange of information between Member States, responsible authorities shall be established or designated.

3.2 Decisions and Programmes

3.2.1.1 R&D Programmes: Energy Framework Programme (1998-2002)

Currently, several relevant R&D programmes exist in the EC in the field of environment and energy. Under the programme JOULE-THERMIE - which is continued under the Fifth Framework Programme of the EC in the area of research - technological development and demonstration, demonstration and dissemination of new and clean energies, and research and development projects are promoted. Through SAVE, a number of projects aiming at enhancing energy efficiency receive financial support, including studies, pilot programmes and specific actions to improve energy management at the regional and local levels. The programme ALTENER aims at increasing the market share of renewable energy sources. In addition to financing studies and information activities, energy production based on renewable energy can be supported directly within the framework of ALTENER. Together with the programme SYNERGY (which aims at energy co-operation with third countries), SAVE and ALTENER were integrated in 1998 in the Energy Framework Programme 1998-2002. This Programme also contains a sub-programme for the promotion and dissemination of clean technologies for using solid fuels (CARNOT).

It is expected that these programmes will be continued in the foreseeable future and will thus also be relevant to the application countries after their accession. Even today, central and eastern European countries can participate in the programmes in accordance with the relevant provisions contained in the protocols supplementing the association

agreements. There are no direct substantive or reporting obligations flowing from these programmes. However, under the programme SAVE Member States are expected to submit annually overviews of their relevant national programmes to achieve best-possible complementarity. In addition, applicant countries may wish to adapt their institutional structures and procedures so as to be able to take full advantage of the programmes. To receive assistance, it is especially necessary to submit lists of proposed projects under the respective programmes.

3.2.1.2 Coal Subsidies

State subsidies for the coal sector are subject to approval by the European Commission under the rules of the European Community for Steel and Coal (ECSC). The Commission determined criteria for the approval of such coal subsidies in its Decision 3632/93/ECSC of 28 December 1993 (which may be changed in the future). Accordingly, any coal subsidies have to fulfil at least one of the following conditions in order to qualify for approval:

- The competitiveness of coal mining is improved with respect to world-market coal prices and the amount of aids can be reduced.

A contribution is made to the solution of the social and regional problems associated with the reduction of coal mining.

- Investments are made to comply with environmental standards for coal mining.

Formally, the applicant countries will only be subject to these provisions after accession to the EC. However, those countries with a coal industry should check their current coal policies and adapt them to the greatest extent possible prior to accession. This will help guarantee a smooth transition and avoid the fractions and social tensions that might arise later on as a result of the re-orientation of policies required under ECSC rules.

3.3 Environmental Agreements

In the field of environment and energy, two environmental agreements have been concluded with manufacturers and importers of household appliances. These determine minimum energy efficiency standards for (1) televisions and video equipment in stand-by mode and (2) washing machines. Complementary agreements on dish washers and TVs and video equipment in on-mode are under discussion or envisaged, and may be concluded prior to any enlargement of the EC.

Any country acceding to the EC is likely to face requests that its relevant industry subject itself to the same standards laid out in the environmental agreements. As a first step in preparing for such requests, accession candidates may wish to assess whether and to what extent relevant industries exist in their countries. These include manufacturers of the mentioned products (TVs, washing machines, dish washers) and (sufficiently large) businesses importing these products from non-EC countries.

3.4 General Policies and Strategies for the Future

The following deals with three areas for which the development of general policies and future strategies has been sufficiently advanced in the Community: (1) the combined use of heat and power (co-generation), (2) the employment of renewable energy sources and (3) the advancement of energy efficiency.

These strategies/policies are neither binding nor directly relevant to the applicant countries, but they will benefit from taking the long-term orientation of Community into account when developing their policies prior to accession. This might help counter political opposition to/secure political support for their applications and remove barriers to a smooth post-accession integration into the Community. Applicant countries might therefore wish to design policies so as to bring them in line with the general approaches pursued by the EU.

3.4.1 Combined Heat and Power (Co-generation)

The strategic orientation of European policies with respect to co-generation was outlined in a strategy paper of the Commission in 1997 (European Commission 1997a). Accordingly, the EC aims at doubling the share of combined heat and power production in total electricity production from 9 % in 1994 to 18 % in 2010. A number of existing and planned regulations (e.g. liberalisation of the energy markets, taxation of energy products, the large combustion plant directive) and the existing R&D programmes may contribute to an increasing use of co-generation technology.

3.4.2 Renewable Energy Sources

In November 1997, the Commission published a White Paper on the future Community strategy for the development of renewable energy sources (European Commission 1997b). Although the White Paper has not yet been formally approved by the Council, it can be assumed that, especially in the light of ongoing efforts at integrating energy and environmental policies in the Community, its elements will built the basis of future EC policies in the area.

First of all, the White Paper establishes the target of increasing the share of renewable energy sources in total energy supply in the EC from currently nearly 6 % to 12 % by the year 2010. Part of the strategy is the programme ALTENER (see above) and plans for a electricity feed-in directive (see below). Other elements aim at supporting the use of bio-fuels; furthering the production of biomass in agriculture; specific measures to enhance the use of photovoltaics, wind energy and the build-up of energy production capacity based on biomass; and the further development of European norms and standards for renewable energy technology.

3.4.3 Energy Efficiency

No separate strategy has been established with respect to EC policies on energy efficiency (but see labelling and minimum standards for appliances dealt with above). However, general political objectives have been formulated by the European Commission and the Council. The most important element of EC policy in this area has been the continual improvement of efficiency of energy use aimed at de-coupling energy consumption and economic growth. Not least, improvements in energy efficiency have been identified as a - if not the - central element of the Community's strategy to combat climate change.

3.5 Planned and Proposed Activities

3.5.1 Integrated Resource Planning Directive

In 1995 the European Commission submitted a **Proposal for a Council Directive to introduce rational planning techniques in the gas and electricity distribution sector**, which was amended in 1997 (COM(97) 69). The objective of the proposed Directive is to stabilise carbon dioxide emissions by the year 2000 at the level of 1990 in the Community at a whole and at the same time to improve end-use efficiency in the electricity and gas distribution sectors through the introduction of rational planning techniques (integrated resource planning, IRP). Based on these techniques investment opportunities in energy supply and energy demand are to be evaluated on a single economic basis.

It envisages the development of an energy services market where consumer's energy needs are provided for with lower commodity consumption. In all cases, the Commission suggests only economically justified investments and leaves the question of energy taxes and energy efficiency subsidies up to individual Member States.

In addition, the Member States are asked to create incentives for consumers to make energy efficient investments and to draw up demand side management plans for low-income energy users.

3.5.1.1 Administrative Requirements

Member States have to appoint a responsible authority, which controls the implementation of economic measures arising from the strategic development plans which have to be presented by the electricity and gas companies and are intended to increase energy efficiency.

3.5.1.2 Procedural requirements

According to the directive, the Member States have to establish a procedure in which the electricity and gas enterprises are required to present an integrated resource plan to

the competent authorities, showing how they want to meet future energy demand. The plan shall evaluate all energy-resource alternatives on a single economic basis.

In order to give electricity and gas companies an incentive to use cost-effective planning techniques, Member States shall ensure that electricity and gas enterprises sell energy-saving services to the consumers and that the position of these enterprises is equal to those not covered by this Directive. This is intended to disconnect company profits from the volume of electricity and gas sales.

Member States have review existing legislation to ensure that mechanism are established which permit electricity and gas companies to recover expenditure en energy-efficient programmes offered to consumers (Art.2) These mechanism shall ensure that the distribution companies which undertake demand side management are not net revenue losers.

Together with the European Commission, the Member States are obliged to review every two years the results from the measures taken based on the directive over the next eight years following the entry into force of the Directive.

3.5.1.3 Monitoring and reporting requirements

The Member states must review the implementation of the economic measures for increasing energy efficiency. They also must review national legislation in order to ensure that the competitive position of gas and electricity companies does not suffer as a result of the demand side management measures.

Further developments:

The proposal for the IRP is now with the Council of Energy Ministers, which needs to agree upon a common position. However, it is unlikely that the proposal will be adopted in the near future.

3.5.1.4 Feed-In Directive (Renewables)

A significant discussion has taken place- both within the Commission and in the public sphere - surrounding the regulation of electricity feed-in or an equivalent promotion of power generation from renewable energy resources, in order to increase the use of renewable energies in the European Union. The European Commission recognised in its White Paper (COM (97) 599 final) that the "access for renewables to the electricity networks at fair prices is a critical step for their development" and discussed the question of a fair entry of renewable energies to the electricity market. The White Paper has not only recommended a European Feed-in Directive, but gone even further to propose its concrete shape.

At present Member States are transposing the internal electricity market Directive (96/92/EC) into national law. The White Paper refers to Article 8 para.3 of the Electricity Directive, which permits Member States to require that electricity from renewable

sources is to be given preference in dispatching. In a decision from 2 July 1998, the European Parliament called upon the Commission to submit a proposal by the 31 December 1998, "based on a right to feed in power subject to minimum tariffs defined by state". The White Paper further refers to the ban under article 7 para.5 of the internal electricity directive which is intended to prevent grid operators from discriminating against other grid users in favour of their own subsidiaries. It states that the guidelines on the price to be paid to a generator from renewable sources "should at least be equal to the avoided cost of electricity on a low voltage grid of a distributor plus a premium reflecting the renewables social and environmental benefits and the manner in which it is financed : tax breaks, etc.".

In October 1999, the discussion has finally turned into a proposal for a Directive. The Directive proposed on the promotion of electricity from renewable energy sources in the internal electricity market follows the White Paper. It establishes common rules for the treatment of electricity from renewables energy sources to cope with the fact that the potential for exploitation of renewable sources of energy is underused in the Community at present.

4 Legal Gap Assessment

At the June 1993 European Summit in Copenhagen it was decided that the Central and Eastern European countries (CEECs) associated with the EU can, in principle, accede to the EU.[6] An indispensable precondition of accession, however, is that the candidate countries should meet the 'Copenhagen Criteria'. These criteria are a stable democracy, the rule of law, an appropriate standard of human rights and the protection of minorities. A functioning market economy that can guarantee that the accession countries are capable of withstanding economic competition within the EU is considered to be a further central requirement. Finally, acceding states must be able to take on the obligations of EU membership, including adherence to the aims of political, economic and monetary union.

The important part in relation to this study are the obligations of EU membership that require existing and future Member States to transpose and implement the EC legislation into national legislation. Part of the so-called *acquis communautaire* (i.e. the bulk of EC legislation consisting of the founding Treaties of the EC and the EU, the legislation adopted by the European institutions (secondary law) and the jurisdiction of the European Court of Justice) will automatically gain validity with the accession. The secondary law, in the field of environment consisting of approximately 300 legal acts, not only has to be transposed into national legislation but also implemented and enforced in administrative practice.

In preparation for the actual accession negotiations, the Commission has been involved since April 1998 in the process of 'screening' the accession countries' legislation to measure the extent to which harmonisation with the *acquis communautaire* has already been achieved. The screening exercise provides timely identification of both 'gaps' in accession countries' legislation and areas that may cause problems for the implementation of European environmental law in the future.

The *acquis communautaire* is divided into 31 chapters for each of which legal gaps are identified. In contrary to the legal gap assessment of this study, the relation and dependence of the environment (chapter 22) and the chapter on energy (14) are not taken account of in the official screening exercise. This section of the study attempts to provide a more detailed and inter-linked picture of the field of environment and energy than was provided in the screening exercise.

The study's chapters contain summaries of the country reports of the Czech Republic, Estonia, Slovenia, Poland and Hungary and are annexed to this study. These summaries provide only an overview of the general situation in the specific countries. For further detailed information, the full country reports should be referred to. The summary section is concluded by trying to identify similarities and differences in the five countries by a

[6] The meeting of the European Council took place from 21-22 June 1993 in Copenhagen.

cross-country approach for each of the issues in discussion. Major implementation gaps and the general prospects for approximation EC policies on environment and energy will finalise this section.

The country reports follow the outline developed in Work package 2: EC regulations in the field of environment and energy. In each of the country reports, national legislation concerning environment and energy is compared to the relevant EC legislation to identify legal gaps. The country reports are submitted by independent national experts and do not necessarily reflect the official opinion of the respective governments.

In the country reports, national legislation in relation to existing and proposed EC Directives and Regulations are analysed taking into consideration the substantive, institutional-administrative, procedural and monitoring and reporting requirements. Additionally the situation in the Accession Countries concerning environmental agreements and general policies and strategies of the EC in this field are examined to assess difficulties and challenges in the future membership in the EU.

4.1 Czech Republic

Since independence, the Czech Republic has passed a number of laws and other regulations covering the field of environment and energy. The main objective of this rule-making process has been to make the Czech legislative framework live up to the challenges posed by the transition process from a centrally planned to a market economy. The revision process has also aimed at adapting the Czech legal order to the EU requirements in order to prepare for accession to the European Union.

This process has by no means been finalised. To the contrary, in most of the areas dealt with below legal gaps between the Czech legislation and EU regulations relevant for environment and energy persist and need to be closed in the years to come. In order to do so, the Czech government either has already introduced a number of legislative acts or is planning to do so during the next years. It is expected that this might lead to full compliance with EU requirements early in the 21st century.

4.1.1 Energy Markets and Energy Taxation

The requirements of the Directives on the electricity and gas markets and the Directive on energy taxation are not yet fully met in the Czech Republic. While the Czech law 222/1994 created a legal framework for opening the energy markets to private business and the electricity market is open to independent producers and autoproducers, it does not guarantee transparent and non-discriminatory access to the *electricity market* and the *internal market in natural gas* as required by the EC Directives. The wholesale electricity market, but not the retail market, has been opened fully. It is unclear whether this is in line with the Directive on the electricity market. In the case of both energy market Directives, further requirements (of a procedural and institutional nature and related to monitoring and reporting) appear to pose limited difficulties. A more serious problem

appears to be the lack of guidelines for negotiated third party access that would provide a level playing field for new competitors that want to enter the market. A further major deficiency with respect to the gas market constitutes the lack of a definition of "eligible customers" under Czech law, as prescribed by the Directive.

Originally, a "small novel" was planned and drafting work started to update the existing energy law. In the meantime, however, it has been decided to create a completely new energy legislation in order to bring the Czech legislation fully in line with the requirements of the EC Directives. A first draft of the new law was circulated in mid-1999 for comments. Full transposition was planned for 2000 (full implementation: 2001). However, some delays have already occurred and may lead to a postponement of this schedule. It appears that the Czech Republic will ask for an extension of the deadlines for implementing the two Directives in the accession talks.

Significant gaps in the transposition of the Directive on the harmonisation of the structures of excise duties on mineral oils also exist. First of all, Czech tax rates for petrol, gas oil and petrol mixtures are lower than required under the EC Directive. Other energy products covered by the Directive (kerosene, liquid petroleum gas) are not taxed at all. Furthermore, excise taxes on mineral oils are currently paid back to consumers under Czech law if the taxed product is used for heating purposes and generating electricity, an exemption not in line with EC requirements. These gaps may actually widen if the proposed new Directive on the taxation of energy products is passed (as it may increase tax rates and include further energy products). In contrast to these substantive gaps, requirements related to procedures, institutions and monitoring and reporting appear to pose little problems. While a draft new legislation is in process in the Czech Republic, it is unclear whether and when this may be passed and whether it will fully comply with EU requirements (current best estimate: 2005).

4.1.2 Plant Specific Directives

Major legal gaps also exist with respect to the Large Combustion Plant (LCP) Directive (and its forthcoming revision) and the Integrated Pollution Prevention Control (IPPC) Directive. As regards the LCP Directive, emission limits set under Czech law by and large appear to be in line with EU requirements. However, while source size is defined in terms of thermal output in the Czech Republic, EC rules categorise in terms of thermal input. Furthermore, emission limits under EC rules decrease linearly with plant size in the case of SO_2. In contrast, Czech law defines emission limits for certain categories of plants spanning a range of sizes. While most other requirements apparently pose no problems, the Czech Republic also has no legislation in place in order to ensure that other Member States that may be affected environmentally by the operation of a combustion plant are consulted appropriately before implementation of such a project. The Czech Republic has signed but not yet ratified the relevant UN ECE convention on transboundary effects.

The emission limits proposed under the new LCP Directive would require further adaptations of the Czech legislation, as those limits are more stringent than current Czech standards. According to the planning in late 1999, a new legislative act will ensure full fulfilment of strengthened EU requirements. The new legislative act has been approved by the government and is to be effective from the year 2001.

Even more serious difficulties exist in the case of the IPPC Directive. Whereas a number of relevant pieces of legislation exist, these only cover parts of the IPPC Directive and operate separately (in contrast to the integrated approach required by the IPPC Directive). In particular, existing permits are not updated to ensure application of best available technique (BAT), there is no integrated approach among numerous permitting authorities and there is no involvement of the public.

Implementation of the IPPC Directive will thus require substantive changes to the current legislative framework and practice (including administrative re-arrangements with respect to permitting authorities). The IPPC is planned to be implemented by including the requirements in the Czech Act on the Environment. This process (that does not appear to have reached any official stage yet) should be complete by the end of 2001. In face of the challenge posed by implementing the Directive on the ground, the Czech Republic will ask for a transitional period of three years for the application of the Directive to existing installations in the Czech Republic (which would thus be controlled fully only by the end of 2010 instead of 2007). It may, however, be even doubtful whether all requirements applicable to new plants can be implemented in time.

4.1.3 Energy Efficiency

Fulfilling the EC requirements laid down in the Directives on SAVE, the labelling of energy consumption and energy efficiency requirements of household appliances all require further legislative and other action. In the case of SAVE, some activities short of legislation exist in some of the areas listed in the Directive (energy certification of buildings, thermal insulation etc.). It is somewhat unclear to what extent these existing activities already fulfil the largely procedural requirements of the SAVE Directive to fulfil and implement programmes in the mentioned areas. The effect of the existing activities, however, apparently has been very limited.

The picture is clearer in the case of the Directives on labelling of energy consumption and energy efficiency standards of household appliances. In both cases, equivalent Czech regulations do not exist and thus need to be developed from scratch. In relation to all three Directives, institutional capacity exists in the form of the Czech Energy Agency (CEA) and the State Environmental Fund (SEF) that should be sufficient to fulfil the institutional requirements under EC law.

The requirements of all three EC Directives related to energy efficiency will, according to the current planning of the Czech authorities, be implemented in full in the context of passing a single legislative act, the proposed Energy Management Act. The fate of this

Act appears to be uncertain to some degree as the legislative process is expected to start in the year 2000 only. It is unknown when it might be passed eventually, but current planning is that the Act would fully implement the existing EC legislation. Some follow-up activities will be required in the form of issuing relevant government decrees specifying some of the efficiency standards in particular.

4.1.4 Other Policies

Two aspects of other policies relevant to the field of environment and energy deserve particular attention in the case of the Czech Republic: coal subsidies and policies for furthering renewable energy sources. The Czech Republic is one of the traditional coal producers in Europe and has subsidised coal mining extensively in the past. Since independence, state subsidies for the coal sector have generally been aimed at closing down mines and phasing down mining capacity. Whereas levels of state subsidies have roughly remained at the same level throughout this process, it is believed that they are in line with the established EC criteria. Thus, no difficulties are expected in reaching approval of the subsidy scheme by the European Commission upon accession. The details will, however, have to be worked out with the Commission. In this context, it is worth mentioning that the Commission usually requires a stepwise reduction of subsidies).

With regard to renewable energy sources, the Czech Republic has established the objective of increasing the share of renewables in primary energy consumption about fourfold from current levels (1.4%) to 6% in 2010 (mainly by higher utilisation of biomass). In relative terms, this is more ambitious than the goal pursued by the EU (doubling by 2010). A proposal for guaranteed feed-in prices for electricity originating from renewable energy sources was refused by the Senate of the Czech Republic in 1998 and stands little chance of being adopted. Utilisation of renewable energy sources is, however, supported through grant programmes, the granting of a reduced tax rates for certain kinds of renewables (biofuels, water and wind turbines and wood waste). Also, operators of renewable energy sources are exempted from income tax for the first five years following commissioning of the equipment. Buildings for renewable energy production purposes are exempted from the construction tax. Further measures are currently not foreseen.

Other policy areas do not appear to constitute serious obstacles to acceding to the EU. The Czech Republic already participates in the Energy Framework Programme (1998-2002) and generally aims at increasing energy efficiency. Integrated resource planning does not appear to have major support in the country, but co-generation might be supported by legislation in the future (uncertain). Finally, no major producers of relevant household appliances for which voluntary agreements have been concluded at the EU level exist in the Czech Republic. Imports mainly originate from the EU itself. Thus, the voluntary agreements should not pose major problems for Czech business.

4.1.5 Conclusion

Overall, large gaps thus remain to be closed with respect to relevant EC legislation in the field of environment and energy in the Czech Republic. In none of the areas where Directives exist are the requirements completely fulfilled. To the contrary, large gaps persist with respect to the liberalisation of energy markets, energy taxation, the LCP and IPPC Directives, whereas implementing legislation concerning the Directives aiming at energy efficiency improvements is missing completely. As in the case of other central and eastern European countries – and indeed several existing EU Member States – the IPPC Directive appears to pose a particular challenge, as the integrated approach pursued by way of this Directive requires an administrative restructuring and the adaptation of existing practices to a fundamentally different approach.

Generally, the main problems are related to the substance of the Directives, be it emission limits in the case of the LCP Directive, the definition of eligible customers under the gas Directive, the scope of taxation and tax levels under the Directive on energy taxation or the integrated permitting procedures required under the IPPC Directive (as the IPPC Directive focuses on procedures and thus procedural requirements form its heart). Institutional structures and conditions for fulfilling procedural requirements (except those under the IPCC Directive) and requirements for monitoring and reporting appear to be far more advanced. These requirements may thus be fulfilled comparatively easily upon full implementation of EC law in domestic legislation.

In all the deficient areas, legislation has been introduced, or is planned to be introduced in the near future, in order to close the large remaining gaps. According to the planning of the Czech authorities, the bulk of the legislation should be in place early in the 21st century (2001/2002). However, some of the legislative foundations that are under preparation will need to be fleshed out by issuing supplementary legislative acts (government decrees etc.) and enforcing the upcoming legislation on the ground will require further action. Moreover, some delays have already been encountered in the past in the legislative process that is still very much in flux and undetermined with respect to the field of environment and energy. Given the uncertainties in future domestic political debates in the Czech Republic, further delays cannot be excluded. It may thus be assumed that full implementation and enforcement of relevant EC requirements may well continue beyond the early years of the first decade of the 21st century.

4.2 Estonia

The approximation in Estonia in the field of environment and energy is still process. Only some of the main requirements of the EC legislation find their correspondence in Estonia. The Estonian Energy Act, adopted in June 1997 is the most important legislative act regulation in the energy sector. It includes the basic market principles of the energy market. The legislative process has by no means be finalised. To the contrary the summary below shows that legal gaps between Estonian legislation and EC regulations

persist and need to be closed in the years to come. It seems however that the legislative activities in the field of environment and energy somehow slowed down. Whereas in the field of environment three important legal instruments, like the Ambient Air Protection Act, The Waste Act and the Chemicals Act have been adopted. The most recent act in the field of environment and energy dates from the year 1997.

4.2.1 Energy Markets and Energy Taxation

The two Directives on the markets in electricity and natural gas have been transposed in Estonian law by the aforementioned Energy Act and additional secondary legislation. However full alignment with the Electricity and Gas Directives has not yet been reached.

The Estonian Energy Act regulates the generation, transmission and distribution of electric power. Accordingly with the Electricity Directive, the production of electricity in Estonia is in principle open to independent and auto producers. However there are no set procedures for building a new capacity. Estonia has not yet chosen between an authorisation and a tendering procedure, as required by the Directive. The state-owned company Eesti Energia is responsible for the production, transmission and distribution of energy. This monopolistic structure is not in conformity with the principles of the Directive, which aims at a competitive market in electricity.

The same is true for the gas market. There is only one company, privately owned, producing, transmitting and distributing gas. Instead of a definition of “eligible customers” there is only a definition of “large customers” which is not in compliance with the Directive.

The authorities required in both of the Directives which are responsible for authorisation procedures for the access to the systems, system operators responsible for operating and ensuring the maintenance of the transmission and the distribution systems do not find their equivalent in Estonian legislation. Additionally, there are no designated authorities to settle disputes on negotiations and refusals of access to the systems.

There is no third party access to the transmission and the distribution networks (electricity) and the control of the state owned power system "Eesti Energia" is undertaken by the Energy Market Inspectorate.

However, harmonisation is gradually being continued and the Energy Act will be amended aiming at the full compliance with the EC legislation in the year 2002.

The field of taxation concerning mineral oils does not yet fully correspond to the requirements of the Directive on excise duties on mineral oils. There are excise taxes but not for all the energy products and they are lower than required by the Directive. Gas oil and liquid petroleum oil are exempted from Estonian taxation. In contrast to these substantive gaps, requirements related to institutions and procedures appear to not pose as a problem since there is a tax authority, a customs board and tax board responsible for the task of the Directive. The substantive gaps might be filled once the Estonian plans to

increase excise taxes in accordance with the Directive are adopted. However there is no specific draft legislation aiming at compliance with EC legislation.

4.2.2 Plant Specific Directives

The Estonian legislation controlling air pollution from large combustion plants will require further amendments in order to fulfil the requirements of the Large Combustion Plant Directive. Currently Estonia has a number of legislative acts corresponding to air pollution control, required in this Directive and the IPPC Directive.

Nineteen Estonian Companies fall under the Large Combustion Plant Directive, all of them built before 1987. As the Directive prescribes, emission limit values only for new plants major problems with the compliance of the Directive are not expected. Although a national ceiling for the total emission of SO2 and NOx will only be negotiated during the accession talks, accession countries are required to set up plans for the phased reduction of total annual emission of the existing plants. Estonia does not have such a programme yet.

As the Directive presupposes there is a licensing system for the operation of all combustion plants, notably to set out emission limit values for SO2,NOx and dust. It is however not clear whether the emission limit values set out in the Estonian legislation correspond with the ones of the Directive. This is especially important considering the revision of the Directive aiming at even higher emission limit values and enlarging the scope of the Directive to gas turbines.

The monitoring requirements of the Directive are not fully transposed in the Estonian legislation. Due to a lack of equipment and specially trained employees, calculations are used instead of monitoring. Therefore the value of real emissions can not be assessed. There is also no annual emission inventory of SO_2 and NO_X from existing plants over 300 MW and refineries as required in the Directive.

As in most of the Member States the transposition and implementation of the **IPPC Directive** poses problems in Estonia. To date, there is no Estonian legislation transposing the IPPC Directive but the legal transposition is expected to be completed by 2002. A draft Act on Integrated Environmental Permits is expected to enter into force in March 2000. Until now the Estonian permitting system has been sectoral, with separate permits delivered for air, water and waste. The current Estonian environmental legislation does not comply with the Directive as the integrated approach of the permitting system is lacking and the BAT concept is not applied. Additionally there are no rules on grating information on permits and applications to the public. As far as monitoring and reporting is concerned, the current Estonian legislation does not require sufficient emission monitoring.

Implementation of the IPPC Directive will thus require major efforts. Currently it is expected that the drafted Act on Integrated Environmental Permits, to enter into force in March 2000 will transpose the IPPC requirements. This act will be supported by other

procedural regulations building the basis for the integrated permitting approach. The relatively advanced status of the draft legislation is the most probably reason why Estonia does not intend to ask for transition period for the implementation of the Directive as most of the other Accession Countries plan.

4.2.3 Energy Efficiency

The various European Directives tackling the energy efficiency such as the programmes under the SAVE Directive, the Directives on energy efficiency of household appliances or on hot water boilers, and the Labelling Directive concerning the consumption of energy only seem to be partly reflected in Estonian legislation.

Currently there is no legislation in force regarding energy efficiency in Estonia. A “Energy Conservation Programme” has been drafted and planned to be adopted at the end of 1999. The requirements of the SAVE Directive are however only partly covered in the planned programme.

Equally there is no legislation to cover the labelling and standard product information required in the Labelling Directives. Aiming at the transposition of the Directive the Estonian government has drafted an "Act on Energy Efficiency of Equipment". The new Act will harmonise Estonian legislation with the requirements of not only the Labelling Directives but also with the requirements of the Directives concerning the energy efficiency of hot water boilers and household refrigerators. To date, there is no legislative structure to fulfil energy efficiency requirements of these Directives. Although full transposition and implementation is expected to take place in the year 2002, there is no set date, when the new Act on Energy Efficiency of Equipment will enter into force.

4.2.4 Decisions and Programmes

For Estonia the oil shale production is of particular importance. The share of coal amounts to less than 1 % of the total energy supply in Estonia and coal subsidies are thus not applicable. Although the restructuring of the oil shale industry and the related power industry is of high priority for Estonia the oil shale industry is set up to not receiving any state aid. Nevertheless, Estonia's energy policy is enhancing the strategic importance of the oil shale industry as stated in "the Long Term Development Plan for the fuel and energy sector".

With regard to energy efficiency programs it has to be stressed that already 13 % of the total electricity production in Estonia is generated in co-generation which is to be raised by several state programmes in order to further increase the energy efficiency. As far as the renewable energy is concerned, according to official statistics the total share of renewable energy sources in primary energy supply amounted 10% in 1997. A target of 2/3 increase of the use of renewables to the year 2010 against 1996 are laid down in the National Long Term Plan with means of tax allowances for both, the respective investment and the energy production. Nevertheless it has to be mentioned that a significant

share of renewable consists of biomass, mainly wood chips. Superseding to EC legislation in Estonia legislative clauses for feed-in tariffs have been introduced into the existing legislation in order to promote the use of renewable energy sources for electricity generation Estonia. Additionally Estonia already takes part in various programmes international programmes such as THERMIE and is aiming to participate in ALTENER and SAVE. Concrete steps have been taken to increase energy efficiency including measures addressing the end user as well as the distributor and generator of energy.

In Estonia there is no production of the equipment for which on the European level environmental agreement have been made.

4.2.5 Conclusion

Overall, large gaps thus remain to be closed with respect to relevant EC legislation in the field of environment and energy. It seems that Estonia has not made significant progress in aligning the national legislation with the one of the EC. Although in none of the areas analysed the requirements of the respective Directives are fully compliant, Estonia seems to be more advanced concerning the legal transposition of the IPPC Directive than other Accession Countries (and several Member States). Contrary to other countries quite detailed draft legislation intended to transpose the far reaching integrated approach of the IPPC Directive into Estonian legislation already exists.

The central legislative act, the Estonian Energy Act still needs to be further amended for full alignment with especially the Electricity and the Gas Directive. Further efforts are needed to prepare participation in the internal energy market including the monopolies and access to networks.

With respect to the different kinds of requirements, the main problems are related to the substance of the respective EC rules. But also institutional structures are not in place, which could be used for implementing EC rules properly. Due to the lack of personnel and financial means the same is true concerning monitoring and reporting.

Estonia's oil shale sector, providing 98% of locally generated primary electricity supply is a unique challenge for the country. Not directly covered by the EC legislation in the field of environment and energy the oil shale production is responsible for environmental problems. Responding to this specific problem the European Commission requires the development of a viability plan for the oil shale sector and recommends that privatisation in this sector be made in the most transparent way.

It has to be highlighted that compared to other Accession Countries Estonia seems to be well advanced concerning both the use of co-generation and renewable energy. There are important strategies and programmes promoting the increased use of these alternative energies.

4.3 Hungary

The approximation process concerning the field of environment and energy in Hungary has started since the accession agreement with the European Union was signed in 1991. Since then considerable progress has been achieved. Many European Directives in this field find their equivalents in the Hungarian legislation. However to reach full compliance with European legislation some substantial efforts will have to be taken. It seems obvious that the objective aimed at in the National Programme of the Adoption of the Acquis Communautaire in the year 2001 will not be met. Contrary to the National Programme where the adoption of 45 acts was foreseen for the year 1999, only four acts have been adopted that transpose European legislation in Hungarian legislation.

The main problem concerning transposition of EC in the field of environment and energy is the lack of sufficient legal experts in the respective Ministries. The lack of personnel resources is even worse concerning the administrative implementation and enforcement of the legislation. The position of permitting and supervising authorities in the environment and energy sector is quite weak compared to other administrative bodies. Furthermore, the lack of financial resources and know-how leads to weak monitoring and enforcement performance.

4.3.1 Energy Markets and Energy Taxation

The requirements of the Directives on the electricity and gas markets and the Directive on energy taxation are not yet fully met in Hungary.

As far as the access to the electricity and gas market is concerned it seems that both are entirely open. As with respect to the electricity market, in principle everyone can receive a permit producing energy. There is no definition in the Hungarian legislation for independent and auto producers as required by the Directive. According to the electricity and the gas market, there are set market shares that have to be open to independent and auto producers. In consequence to the openness of the market there are no such market shares in Hungary. The access to the transmission and distribution system, however, seems to be restricted in both systems although there is a competent authority granting authorisation for the production, transmission and distribution of electricity and gas. Concerning the access of the gas transmission system, it seems that the Hungarian legislation does not provide for a definite regime for the network access.

The institutional requirements of the Directives concerning the liberalisation of the electricity and the gas market appear to be basically fulfilled in the Hungarian system. The Hungarian Energy Office provides permissions for operators for the transmission and distribution of electricity as well as for accepting and distribution gas. At present, however, there is only one company undertaking transmitting electricity. The Hungarian Electricity Stockholding Company retains a monopoly not only for electricity transmis-

sion but also for transit and import/export.[7] According to the Directive on the liberalisation of the electricity market this monopoly has to be phased out.

In compliance with the Directives the system operators for the distribution systems which are privatised (and sometimes hold a monopoly in particular Hungarian regions) are responsible for the maintenance and security of supply of the system.

Concerning the construction of new electricity generation capacity and production of gas, Hungary has chosen the authorisation system as one of the options of the electricity Directive. However the criteria, according to which permits are granted, do not fully correspond to the EC requirements. This is due to the criteria relating to safety and security of the system which are only regulated on a technical standard level and are not easily accessible to the requester or to the public. The environmental criteria are not well developed; it appears that environmental aspects are either included or excluded into the permission depending on the discretionary power of the Hungarian Energy Office.

The monitoring requirements ensuring appropriate and efficient mechanisms for regulation control and transparency, so as to avoid dominant market positions, appear not to be fulfilled neither regarding the electricity market nor the gas market.

Despite the fact that both of the Directives are not entirely fulfilled, it is not clear which legal steps are taken to enhance the compliance with the EC legislation and why no transitional periods will be asked for during the accession talks.

The area of taxation concerning mineral oils does not yet correspond to the requirements of the Directive on excise duties on mineral oils. There are environmental product fees on unleaded petrol, some other types of petrol, heavy fuel oils, gas oils and other products. These fees do not correspond to the requirements of the Directive because they do not reach the minimum tax level and the intention for levying is different to the Directive. These gaps may actually widen if the proposed new Directive on the taxation of energy products is passed (as it may increase tax rates and include further energy products). However, the administrative implementation of the Directive in Hungary would not require major institutional changes since a tax authority under the supervision of the Ministry of Finance already exists.

4.3.2 Plant Specific Directives

In the field of plant related Directives it seems that the approximation concerning the Large Combustion Plant Directive has significantly advanced. However it has to be noted that national emission reduction targets for the sulphur dioxide, nitrogen oxide and dust for Hungary will have to be negotiated only during the accession talks. Due to the fact that there are no national programmes concerning the reduction of emissions from existing plants, it is possible that the national emissions ceilings, once set, will

[7] Screening report as of 26 of March 1999

pose some problems for Hungary. In the past, important emission reductions have been achieved due to economic decline since 1980.

The Hungarian legislation requires emission limits for all combustion plants equal to or superior than 50 MW and is thus in compliance with the Directive. For new plants the Directive requires stricter emission limits ensured by a licensing system for the operation of all combustion plants. According to the Directive "existing plants" are plants licensed before 1 July 1987. However, there seems to be a different definition according to the Hungarian system. In contradiction with the Directive, Hungary's cut-off date defining existing plants is 11 July 1998. Instead of applying emission limit values for plants licensed since the latter date, Hungary intends to establish national programmes for the progressive reduction of total annual emissions. For plants considered as "new" under the large combustion plants Directive this would result in a derogation and thus non-compliance with the specific emission limit values prescribed by EC legislation.[8]

The institutional and procedural requirements of the Directive seem to be basically ensured. There is a major licensing authority (Hungarian Energy Office) for large combustion plants. The licensing authority is also responsible for the reporting requirements of the Directive. Environmental inspectorates are responsible for monitoring.

Contrary to the picture provided concerning the Large combustion plant Directive, the approximation of the Hungarian legislation in relation to the IPPC Directive is not well advanced. As in most of the Member States, the transposition and implementation of the IPPC Directive poses problems in Hungary. Substantial modifications to the existing system are necessary to comply with the requirements of the Directive. To date no integrated permitting system exists, although the issuing of an environmental permit requires the approval of all relevant authorities. Although not all existing plants are currently covered by the Directive, they are subject to an environmental licence. All activities covered by the Directive will also be subject to the new integrated permit type requested by the Directive. In addition not all environmental impacts are assessed and licences do not include requirements on emergency plans and are not periodically reviewed to take account of developments in the state-of-the-art. Most importantly, Best Available Techniques (BAT) are not always applied. An additional problem that will occur, as contrary to the IPPC Directive, is if Hungary considers as "existing" those installations which have a valid licence of establishment before the beginning of the year 2002 or by the latest the date of accession. According to the Directive, existing plants are defined as installations subject to a full request for authorisation by 30 October 1999.[9] Redefining the cut off date for existing and new installations results in a non-

[8] European Commission, Accession Negotiations Hungary, Draft Common Position, Negotiation Chapter 22, Environment, as of 27 October 1999, Enlargement MD 501/99.

[9] European Commission, Accession Negotiations Hungary, Draft Common Position, Negotiation Chapter 22, Environment, as of 27 October 1999, Enlargement MD 501/99.

compliance situation with EC requirements. This is the reason why Hungary will have to demand transitional periods for the implementation of the Directive.

4.3.3 Energy efficiency

The various European Directives tackling energy efficiency such as the programmes under the SAVE Directive, the Directives on energy efficiency of household appliances or on hot water boilers, and the Labelling Directive concerning the consumption of energy seem to be partly reflected in Hungarian legislation.

For example it seems to be doubtful that the Hungarian Programme on National Energy Saving and Energy Efficiency which reflects only partly the requirements of the Save Directive**,** will effectively lead to improvement in energy efficiency and limit carbon dioxide emissions. If existing, the programme formulation is vague (i.e. energy certification of buildings) or only covers part of the envisaged concept (billing only for heating not for air conditioning and hot water costs).

Whereas the requirements concerning the energy efficiency of hot water boilers are ensured by the new Hungarian Decree of the Ministry of Industry, Commerce and Tourism on hot water boilers, equivalent legislation concerning household refrigerators does not exist yet. According to the Decree, hot water boilers that do not meet EU standards, are not allowed to be put on the market. However, a maximum of 4 % difference from these standards is allowed according to Hungarian legislation. As the Decree is new there is no sufficient experience with the practical implementation of the legislation. Verification bodies exist but their actions can not be assessed yet.

As far as the labelling Directives are concerned the state of approximation seems to be rather poor. Although there is a long tradition in labelling electrical products, the key requirement of the Directives such as the obligation to inform the user on the energy consumption of the product are not met. Since there are lists of products for which labelling is mandatory (but these lists are not legal documents) and the existence of capable authorities to ensure the provisions of the Directive, there is a good basis for the transposition and implementation of the labelling Directives.

4.3.4 Other policies

According to a government proposal of the Minister of Economy on energy savings and energy efficiency strategy, the Hungarian energy policy is aiming at the gradual reduction and finally elimination of coal mining. Although there is no legal structure for coal subsidies, indirect support is widespread. Hungary plans to cover significant parts of the money required to handle the social and labour force problems with EU support.

Not only the reduction of coal mining but also the promotion of energy efficiency, combined heat and power forms part of the above mentioned government proposal. However, there is no legal document or official position defining specific tools and ensuring implementation of energy efficiency measures. Some policy documents references can

be found to increase the actual share of renewable energy sources of 3-4% to 6% by the year 2000.

4.3.5 Conclusions

Overall, large gaps remain to be closed with respect to relevant EC legislation in the field of environment and energy in Hungary. It seems that there is only few directly transposing legislation in Hungary. For most of the Directives, their corresponding requirements are found in several different legal acts, often adopted by different ministries.

The analysis of the implementation of the various aspects of the Directives in Hungary concerning objectives/substantive, institutional, procedural or monitoring and reporting requirements do not show a clear picture. At this time, there are no fields available that are fully compliant with the relevant EC legislation. However even if the institutional structure does not carry out the respective tasks it still provides a good background for the practical implementation of the respective Directives. This is especially the case concerning the “labelling tradition” in Hungary. In the implementation of the Directives the Hungarian authorities can refer to the existing labelling institutions or tax authorities.

Hungary can rely on its well-developed administration network of permitting and supervising authorities in the environmental and the energy sector. This might be the reason why the approximation concerning procedural requirements is rather positive. On the other hand, the implementation rate and the monitoring and enforcement performance is rather weak. As previously mentioned, the lack of financial and personnel resources and the standing of the environmental administration within the hierarchy of the authorities, are several reasons cited as negative results in relation to monitoring and reporting requirements.

4.4 Poland

Poland introduced and passed a number of legislative acts in the field of environment and energy in the 1990s so as to achieve and smooth the transition to a market economy and prepare for accession to the European Union. The process of adapting the legislative framework continues. The most prominent undertaking in this respect appears to be the elaboration of a new act on environmental protection based on a draft prepared by a team of lawyers led by Prof. Sommer, the so-called "Sommer Team draft". In addition, changes to current regulations (ranging from existing laws to administrative guidelines) and establishment of supplementary executive regulations will need to be undertaken to achieve complete compliance with EU requirements.

However, in a number of areas Poland has already adjusted its national rules to a large extent to the EU requirements (e.g., electricity market, labelling, efficiency standards). Further adjustments are envisaged and under preparation. It is therefore expected that

Poland might have implemented the bulk of EU regulations by 2002. Delays are, however, neither excluded nor unlikely. As of the time of writing, however, only a very limited number of exemptions are intended to be asked for by Poland in the accession talks for a transitional period.

4.4.1 Energy Markets and Energy Taxation

No uniform picture arises from the legal gap analysis regarding the EC Directives on the electricity market, the gas market and energy taxation. The accession process appears to be most advanced with respect to the electricity market Directive. The relevant Polish Energy Law was passed in 1997. As this was after the adoption of the EC Directive, most of its provisions were taken into account in the drafting of the Polish law. The latter determines a gradual opening of the electricity market until the end of 2005, establishes an authorisation procedure for the construction of new generation capacity and determines operators of the transmission and distribution systems. Access to the transmission and distribution systems follows a regulated third party access rule. The main problems are related to the fact that, at present, the market is only open for Polish producers an different definitions of transmission and distribution apply. These incompatibilities are planned to be removed by the end of 2002.

More problems exist with respect to the Directive on the internal market in natural gas. Currently, the Polish gas market is characterised by a monopolistic position of one provider. Third party access is limited to gas extracted in Poland – a limitation that will be removed upon EU accession. Furthermore, the definition of eligible customers needs to be adapted to EU requirements so as to ensure an adequate opening of the market. This, however, is expected to be achieved only after EU accession. First, the gas industry needs to be restructured and privatised. Subsequently, at least one further year will be required to enable Polish gas industry to adapt to free market conditions. Thus, the Polish government will ask for a temporary exemption from Articles 17 and 18 of the gas Directive in the accession talks.

The conditions for fulfilling the requirements of the Directive on energy taxation appear to exist in Poland. Excise taxes on energy products are applied and institutions and procedures for collecting these taxes are established. Problems exist with respect to tax levels that in various cases are lower than minimum levels in the EU (in some cases they are higher). Some other minor discrepancies exist (e.g. taxation of other products used for equivalent purposes in the EU and various tax exemptions granted in Poland). Tax levels are planned to be adapted to EU requirements by the end of 2002. However, substantial domestic opposition to these plans exist and may endanger this timetable. This difficulty might become even more relevant in case the proposed new Directive on the taxation of energy products was adopted prior to accession, as this is supposed to increase minimum tax rates and broaden their application to more energy products.

4.4.2 Plant Specific Directives

The LCP Directive poses again few problems with respect to procedural and institutional requirements and monitoring and reporting. Some difficulty exists with respect to the continual measurement of emissions and the procedures to be followed in the case of malfunction or breakdown of abatement equipment. A more serious concern, however, is related to a discrepancy in the definition of "existing plants" (EU: before July 1987; Poland: before 28 March 1990). Most of the difficulties are hoped to be removed once the new Environmental Protection Act (the Sommer draft) enters into force. Further difficulties might arise with respect to the national SO_2 emission ceiling to be adopted in the course of the accession talks, to be fixed as part of the revised LCP Directive currently under discussion. Currently, however, emission limits fixed in the Polish regulations are more stringent than those of the existing LCP Directive.

As in the case of other accession candidates (and several EU Member States), the IPPC Directive appears to be the most problematic piece of legislation as regards EU requirements in the field of environment and energy (and beyond). Current Polish legislation sets limit values for various emissions but does not provide for an integrated approach and a regular review of permits, as required by the Directive. The concept of best available techniques introduced by the Directive has no basis in Polish law. Finally, permit conditions are not made public and transboundary effects are not taken into account. Deficiencies exist thus with respect to institutional (integrated issuing of permits) and procedural requirements as well as monitoring and reporting.

Implementation of the IPPC Directive will thus require substantive changes to the current legislative framework and the administrative practices of issuing permits for installations falling under the remit of the Directive. The necessary legal foundations are planned to be laid once the new Environmental Protection Act (the Sommer draft) has been adopted (planned for 2000/2001). However, establishing the needed administrative and enforcement structures might require more time. Also, it is estimated that the IPPC Directive would apply to about 4,000 existing installations and, in addition, to about 300-400 new installations every year. Preliminary estimates for the energy sector indicate that implementation costs of the provisions of the Directive in this sector alone would be more than Euros 6 billion. In view of the challenges posed by the implementation of the IPCC Directive, the Polish government has therefore asked for a transition period of three years with respect to applying the Directive's provisions to existing installations (which would thus become subject to the requirements of the Directive at the end of 2010 instead of 2007).

4.4.3 Energy Efficiency

In contrast to the situation regarding the IPPC Directive, Poland is already well advanced in the implementation of the requirements of the SAVE Directive and the Directives on the labelling of the consumption of energy and energy efficiency standards. With respect to the scope of the SAVE Directive, legislative activities and/or pro-

grammes have been introduced in most of the areas listed in the Directive. Authorities to enforce the related provisions are generally available and designated. The main area of concern that may require further action is the energy certification of new buildings. This should, however, not pose a particular problem in the accession process.

With respect to both the labelling Directive and the Directive on energy efficiency standards for household appliances, Poland has recently implemented regulations that bring it close to fulfilling the respective EU requirements. Based on the Energy Law of 1997, an ordinance of the Minister of Economy of February 1999 goes a long way to fulfilling the requirements of the two Directives. The Polish regulations even impose the obligation to label the consumption of energy and to achieve certain minimum standards of energy efficiency to a broader set of appliances than required by the EC Directives. Institutional capacity to enforce and administer the said provisions also appear to exist. Obviously, the labels applied are no EC labels yet. Also, the procedures for determining compliance with energy efficiency requirements proscribed by European regulations differ from those applied under Polish law. Some adaptation of the Polish regulations may thus be required, which is, however, not expected to lead to any insurmountable problems.

4.4.4 Other Policies

Among the other EC policies and regulations, the treatment of coal subsidies has a particular relevance for Poland as a major coal producer. Restructuring of the coal mining sector is one of the major challenges in Polish energy policy, that is pursued in the framework of a "Programme of Coal Mining Reform in 1998-2002". This programme aims at achieving profitability/economic viability of the sector in particular by financial structuring, clearance of coal mining establishments, restructuring of employment, and environmental protection measures. The programme planning as such appears to be largely compatible with the criteria for coal subsidies established in the EU, especially since it aimed at reducing and eventually phasing out subsidies. However, the assumptions underlying the planning appear to be outdated since prices have declined below levels that built the basis of the programme planning. Profitability is thus much endangered, and compliance with the EC rules remain uncertain. This points to the possibility that serious problems in the area of coal subsidies might be faced upon accession of Poland to the Union. This is especially true in light of the importance of the coal mining industry in the Polish economy and society.

The promotion of energy efficiency, combined heat and power production and renewable energy sources all form part of the "Energy Policy Strategy until 2010" prepared by the Ministry of Economy in 1995. Little concrete action to support co-generation and the use or feed-in of energy from renewable sources (like tax brakes, a feed-in obligation or guaranteed prices) appears to have been undertaken. The official goal, however, is to increase the share of renewable energy in total energy supply to 6% in 2010 (current

share: 1.5%). Parliament and several societal actors have expressed their interest in developing this aspect of the Polish energy policy.

More concrete steps have been taken in the area of energy efficiency. First of all, Poland takes already an active part in the different components of the Energy Framework Programme (1998-2002). Furthermore, the National Energy Conservation Agency (KAPE S.A.) was created in 1994 and is involved in the implementation of various programmes aiming at enhancing the efficiency of energy use. Its activities are not least related to the areas of implementation of the SAVE Directive (see above). In addition, the National Fund for Environmental Protection and Water Resources, the Bank of Environmental Protection and several non-governmental organisations are actively involved in furthering energy efficiency.

The instrument of integrated resource planning, finally, has some support in the Polish energy law that mandates local-municipal authorities to engage in preparing energy plans. However, the Polish government has not yet developed any particular mechanisms to implement integrated resource planning techniques. (These are to some extent applied and promoted by non-governmental actors.)

4.4.5 Conclusion

In total, it is hardly surprising that legal gaps remain to be closed to bring the Polish legislative framework in the field of environment and energy in line with EU requirements. Significant progress has, however, been achieved already in a number of areas. Thus, little further adaptations are needed in the areas of the electricity market, and the regulations dealing with energy efficiency (SAVE, labelling, energy efficiency standards). Some more substantial adjustments are needed with respect to the LCP Directive and the minimum excise taxes for mineral oils. These difficulties could become more severe if proposed revisions of the Directives in place are adopted. Poland faces more serious problems with respect to the gas Directive, where market opening and restructuring lags behind so that a transition period has been requested. The biggest problem, though, is again posed by the implementation of the IPPC Directive. As in most other applicant countries and many existing Member States, implementation of the Directive will require a major effort aimed at amending the legislative framework but also administrative and procedural structures. Finally, the coal mining sector poses a special difficulty in the accession process in the case of Poland. While a substantial restructuring programme has been initiated that should ensure that coal subsidies are used in line with EC criteria, the underlying assumptions are likely to prove wrong.

With respect to the different kinds of requirements, the main problems are related to the substance of the respective EC regulations. Appropriate institutional structures are generally (with some exemptions) in place and can be made use of for implementing EC rules properly. Much the same holds for monitoring and reporting and with respect to the procedural requirements. The major exception from this rule is the aforementioned IPPC Directive that creates a far-reaching demand for procedural and administrative re-

arrangements. In other words, the substance of this Directive is in its procedural requirements.

The remaining legal gaps are planned to be closed through further reforms that should lead to full complementarity of Polish law with European regulations in the field of environment and energy by the end of 2002. A new Environmental Protection Act is expected to be a major step forward in this process. Transition periods have been requested in the case of the gas and the IPPC Directives. There is a danger, though, that other legislative adjustments will not be passed in time as well or will require further adaptation periods (e.g. energy taxation, coal subsidies). There is thus some likelihood that legislative adjustments to EU requirements in Poland will be a process that may well extend beyond 2002.

4.5 Slovenia

Slovenia made a major step forward in the accession process when the new Energy Act was adopted on 30 September 1999. This new law is relevant to the implementation of the majority of the Directives in the field of environment and energy. Because of the recent date of adoption, it was possible to take into account most of the requirements that became part of the acquis communautaire only relatively recently (like the gas Directive in 1998). The new law thus goes a long way to bringing the Slovenian legislative framework in line with EU requirements.

At the same time, the new law only provides the basis for the implementation of the respective requirements. It establishes a framework that needs to be filled in the future by executive action and the adoption of secondary legislation authorised by the new law. Some uncertainty exists about feasible time schedules as considerable delays were experienced in the legislative process regarding the Energy Act. Thus, while a relatively solid legislative foundation now exists, further action will be required in the years to come to bring Slovenian law and implementation in the field of environment and energy fully in line with EU requirements.

4.5.1 Energy Markets and Energy Taxation

The two Directives on the markets in electricity and natural gas have been transposed in Slovenian law by the aforementioned Energy Act. Slovenian energy taxation is regulated in the Excise Duties Act of 1998. Accordingly, Slovenia has opted for an authorisation procedure with respect to construction of new generation capacity for electricity. From 2003, the market opening will relate to electricity generated outside Slovenia (and will then fully comply with the electricity Directive in this respect). Slovenia also opted for a system of regulated third party access to the transmission and distribution systems. An Energy Agency is established as an independent regulatory body. Apart from that, a certain amount of secondary legislation will be required to take care of the more specific regulations required.

This also holds for the gas Directive. The definition of eligible customers is not fully compatible with EC rules, since a slower market opening is determined until 2006 when Slovenia will realise a wider opening than required under EC rules. With respect to construction and operation of gas facilities and supply of gas, Slovenia has adopted a mixture of an authorisation and a tendering procedure. It is somewhat uncertain whether all aspects of this are in line with EU requirements. In terms of third party access, Slovenia opted for a system of negotiated access.

As mentioned previously, further secondary legislation will be required to fully implement the two energy market Directives in Slovenia. To the extent that the new Energy Act itself may not be fully compatible with the EU rules, it is rather unlikely that revisions will be done in the near future (due to the recent adoption of the law). Those aspects will thus most likely become the subject of discussion in the accession process.

The Slovenian Excise Duties Act implemented from 1 July 1999 in most part transposes the requirements of the existing Directive on minimum taxes on mineral oils. Its structure is generally compatible with European law in that it applies to the same products, has similar exemptions and follows the same logic. Tax levels are in most cases above those required by the EC Directive. Only with respect to gas oil for heating, kerosene for heating and liquid petroleum gas for heating are tax levels lower than required under the Directive. Further needs for adjustments might arise from the proposed Directive on taxation of energy products once adopted. The latter could require an increase of tax levels and a broadening of the scope of taxation to also cover electricity and solid energy products.

4.5.2 Plant Specific Directives

Slovenian legislation controlling air pollution from large combustion plants will only require few amendments in order to fulfil the requirements of the LCP Directive. The relevant Decree sets rather strict limit values to be complied with by the year 2000-2004. Furthermore, institutional structures and administrative procedures are in place which allow to comply with the related requirements.

Limit values for NO_x are, however, not fully compatible and further demand for adjustments in this respect might arise from the new upcoming LCP Directive. Moreover, the is no provision under Slovenian law requiring to inform and consult neighbouring countries about projects that might be of concern to them. A revision of the relevant Decree to bring it fully into line with EU requirements is planned to be achieved by the end of 2000. A difficulty than cannot be resolved in this way, but needs to be addressed in the accession talks is the unavailability of 1980 emission data that usually build the basis of national emission ceilings under the Directive. This should, however, not be a major obstacle.

A major issue to be resolved is the implementation of the IPCC Directive. Although the necessary legal and institutional framework exists, Slovenia's legislation does not yet

provide for the issuance of integral environmental permits for the operation of installations in the sense of the EC Directive. Emission and imission limit values are mostly in compliance with those of the EU, but the principle of best available techniques is not yet included in Slovenian law. Standards of public participation will also need to be introduced and ensured.

Implementation of the IPCC Directive will thus require major efforts. Currently, the introduction of the required legislative amendments is planned for the year 2000. While adoption could be as early as 2001, it should be possible to reach full transposition before the end of 2002. Beyond adaptation of the legislation, real co-ordination of different ministries and agencies in issuing an integral permit will pose a considerable challenge. Furthermore, as in the case of other accession countries application of the IPPC Directive to existing installations constitutes particular difficulties. In addition to technical and economic difficulties faced in this respect, revoking existing permits might create constitutional problems, as these have been issued without time limitations. For all these reasons, Slovenia has asked for a transition period of four years (end of 2010 instead of 2007) for fully implementing the provision of the IPCC Directive with respect to existing installations.

4.5.3 Energy Efficiency

Large gaps remain in the implementation of the three EC Directives related to energy efficiency (SAVE, labelling, efficiency standards for household appliances) in Slovenia. The area covered by these Directives again falls under the remit of the recent Energy Law of September 1999. Implementation will need to be ensured by passing secondary legislation. This is supposed to happen roughly within the next 1-2 years (in 2000 and 2001), but no concrete timetable appears to exist yet.

The implementation task is mainly related to the substance of the aforementioned Directives. Thus, the needed implementation of programmes in the six areas listed in the SAVE Directive is lacking. Labels have to be defined and details not to be regulated (but the general obligation has been introduced in the new Energy Law). Finally, the new Energy Law empowers the Minister for Economic Affairs to determine the required minimum energy efficiency standards of different appliances and products, but related regulations have not been adopted yet. In reality, it is likely that relevant Slovenian businesses already comply with the labelling and energy efficiency requirements of the EU, since this is a precondition for their being able to export to the EU market.

Once the legislative conditions have been created, implementation and enforcement on the ground can rely on an established institutional capacity. In addition to the responsible Ministry of Economic Affairs, the Agency for Rational Use of Energy, the Energy Inspectorate and the Market Inspectorate will be available for the further implementation steps.

4.5.4 Other Policies

The instrument of integrated resource planning is not currently foreseen under Slovenian law. It could be introduced relatively easily in the planning process, as electricity and gas distribution companies have to prepare 2 year plans. There is, however, no intention to do so in the near future.

With respect to renewable energy sources, the new Energy Law contains some rudimentary provisions for preferential access to the market of so-called "qualified producers" to which producers of electricity from renewable energy sources belong. However, no further more detailed regulations exist yet, and existing rules are believed to provide for rather limited support for renewable energy sources.

4.5.5 Conclusion

Slovenia has made major progress towards implementing existing EC Directives in the field of environment and energy mainly by adopting the new Energy Law in September 1999. Whereas prior to that date virtually no implementation in the areas of the energy market Directives and regarding energy efficiency existed, the major foundations are no established. These need to be fleshed out by passing extensive secondary legislation in the years to come in order to make Slovenia comply with EC standards. The case of Slovenia thus illustrates the dynamic situation within many accession countries that can require complete re-assessments of the situation depending on the status of central legislative proposals.

As in the case of other accession countries, institutional capacity and capabilities to deal with monitoring and reporting obligations may need to be strengthened but generally exist. The remaining major challenges are mostly related to passing and enforcing the substance of the Directives (e.g. defining labels and energy efficiency standards. The IPCC Directive has a special position among the relevant EC requirements in Slovenia as well. Although the existing permit system may allow adaptation to issue integral environmental permits, this requires major adaptations. Activities of various administrations need to be co-ordinated and administrative procedures will need to be adapted. Furthermore, introducing the concept of best available techniques requires legislative adjustments.

According to the planning of the Slovenian government, the legislative foundations will be laid by the end of 2002 at the latest. However, as the experience with the new Energy Law demonstrates legislative proposals might be delayed in the domestic legislative process. It is thus hard to predict whether the deadline will be met in reality. In any event, implementation and enforcement of the relevant legislation, and the IPCC Directive in particular, will require extra efforts and time. It may thus be expected that the adjusting to EU requirements will remain a task in Slovenia well beyond 2002 (as also illustrated by the request for a transition period in the case of the IPCC Directive).

4.6 Conclusion

It is hardly surprising that several years prior to the planned accession of the Czech Republic, Estonia, Hungary, Poland and Slovenia, there remain significant gaps in the implementation of the requirements of EC law in the field of environment and energy. Progress appears to be generally most advanced with respect to institutional and procedural requirements (with notable exceptions, see below). Most of the accession countries have established the necessary institutions, competence's and administrative procedures to assign responsibility to specified authorities and fulfil the formal conditions for effective enforcement. It has to be mentioned, however, that institutional capacity (personnel, training etc.) in many instances needs to be strengthened in order to live up to the implementation and enforcement challenge in reality. This is particularly true for the monitoring and reporting requirements of several Directives.

The most serious legal gaps exist with respect to the following issues: substance, including the opening of energy markets to "eligible customers"; energy tax definitions and levels; energy efficiency standards of household appliances; and application of emission limit values to specific installations. In the case of the IPPC Directive, the major requirements are of a procedural nature. As a consequence (and exception of the aforementioned rule), the major difficulties in the implementation of this Directive are also related to procedures. As a common feature among accession countries, the integrated approach pursued through the IPPC Directive is unknown in these countries. It thus poses a particular challenge in all accession countries (but also in many EU Member States). In particular, it will not only require establishing new legislative conditions but also restructuring environmental administrations and procedures. More problems can thus be expected to occur in the implementation of the IPPC Directive in the future.

Summing up the whole field of environment and energy it must be concluded that most efforts have been focused on the liberalisation of the electricity and the gas market. Although progress has been made, further adjustments are necessary aiming at an open market in electricity and gas especially concerning third party access to the transmission and distribution systems. In practice in several countries, monopolistic structures are still prevailing although the legislative acts have been aligned (Czech Republic, Hungary).

Energy taxation according to the Directive on excise duties on energy products will pose a problem in most of the Accession Countries. Although for most of the energy products some sort of taxes are levied, with the exception of the Czech and Estonia which do not impose taxes on kerosene and liquid petroleum, the level of the taxes do not (yet) correspond to the minimum levels required in the EC legislation. In this respect Slovenia seems to be further advanced in imposing taxes for some cases higher than the European ones. In the other countries the problem of excise taxes will be further aggravated with the adoption of the proposed amendment of the Directive planning to include additional energy products as well as rising the minimum levels of taxation.

The situation with respect to the rules on energy efficiency is diverse. Whereas in the Czech Republic, Estonia and Hungary only basic rules exist concerning the labelling of products or programmes implementing the SAVE Directive it seems that Poland faces less problems. In Slovenia legislation to further detail the existing acts has to be adopted to be in full compliance with the EC rules.

The degree of harmonisation seems to be most advanced in all the countries regarding the Large Combustion Plant Directive. All the countries apply an authorisation system for new and existing plants and can profit from the low emission levels caused by the industrial decline. This is however to be taken into account during the accession talks setting national emission reduction targets for each of the Accession Countries.

Overall large gaps still remain with respect to relevant EC legislation in the field of environment and energy in the Accession Countries. In no one country or in any of the areas where EC Directives exist are the requirements completely fulfilled. In all Accession Countries, the main or framework legislation has been introduced recently or is planned to be introduced in the near future. However further action is required by issuing supplementary legislative acts (like government decrees or ordinances) building the basis for administrative implementation and enforcement.

All of the analysed Accession Countries seem to face more difficulties than expected considering the speed of the legislative process. Given this experience of the past it seems probable that the envisaged timeframes for the full implementation of the EC legislation in the field of environment and energy of the year 2001-2003 will not be met. Transition periods for more than the requested Directives will be negotiated in the accession talks. It is therefore likely that the approximation in the Accession Countries will be in process for much longer than the date of accession.

5 Patterns of Regulation and Implementation (Policy Assessment)

5.1 Purpose of the Chapter

Not only the *transposition* of the legislative framework, but also its *practical application* (implementation) and *enforcement* have been defined as key elements of the approximation process by the European Commission. Formal compliance and the mere existence of laws, policy plans and regulations do not automatically guarantee environmental success. These policies have to be translated into action and carried out. This serves as a point of departure for this chapter.

This Chapter completes the findings of the foregoing chapters employing a more comprehensive approach. The process of transposing and implementing EU legislation should not be treated in isolation from the respective environmental and energy policy-making context. The Chapter explores the performance and innovativeness of existing environmental and climate protection policies related to the energy sector. It follows several objectives:

Firstly, the implementation and effectiveness of existing environmental policies in the energy sector are investigated. A second objective is to explore country-specific regulation (or policy) patterns and to assess to what extent elements of an innovation-friendly environmental policy framework can already be identified in the different countries. This step includes a systematic analysis of the instrumentation, policy styles and actor configurations in the field of environmental and climate protection policy in the energy sector. It helps to make policy formulation and implementation in the different countries more transparent. Structural and institutional shortcomings can thus be revealed. Based on the respective findings, recommendations for future capacity building are derived.

5.2 Rationale and Analytical Context

As various comparative studies in the field of environmental policy research indicate, the effectiveness of environmental policy measures is less determined by individual, isolated factors (e.g. the utilisation of one single policy instrument), but rather by a complex set of interacting factors comprising situational, economical, cultural and political variables. For instance, the economic performance of a country, the openness of decision making processes for innovators, the policy style in which decisions are made and implemented, the strength, competence and constellation of policy actors in a policy field and the capabilities for policy learning have been identified as key variables determining environmental policy effectiveness.

By analogy, recent cross-country studies[10] provide empirical evidence, that essential pre-requisites for the development and diffusion of environmental innovations in a country are similar characteristics of the policy-making process and corresponding policy framework conditions. Besides the *structure and set* of policy instruments applied *(policy instrumentation)*, the country-specific *policy style*, which determines environmental policy formulation and implementation, and *sector-specific actor configurations* combined with further *institutional framework conditions* claim explanatory power.

These key attributes refer to the entire process of public decision-making and can be described as *dimensions* or *components* of a country-specific *regulation pattern.* Our understanding of *regulation* is a broad one and comes close to that applied by the OECD. The OECD subsumes the full range of legal instruments by which governing institutions, at all levels of government, impose obligations or constraints on private sector behaviour (OECD 1997).

As described above, one objective of our investigation is to explore such regulation patterns for each country by means of the three policy dimensions explained above. These policy dimensions were made more operational for the analysis. The concept of country-specific *regulation patterns* serves as a suitable tool, which allows evaluating the performance and innovativeness of the policy-making system.

The following section will specify the term *regulation pattern* with its respective dimensions in order to make these abstract categories more operational for our analysis.

5.3 Analytical Framework

The performance of environmental policies and policy instruments cannot be analysed without adequately taking into account the entire process and context of public decision-making. Such an effort requires rather a holistic perspective enclosing the entire policy making process, which analytically can be divided into different phases: agenda-setting/ policy definition, target and policy formulation, policy implementation and policy evaluation.

We employ the concept of country-specific regulation patterns to our analysis in order to assess the performance of environmental policies in the energy sector and in order to evaluate to what extent elements of an innovation-friendly policy framework are developed in each country so far. Crucial policy variables influencing the innovativeness of environmental policy-making are the following:

1. Policy instrumentation

[10] We refer particularly to the findings of the interdisciplinary Research Group on the Innovation Effects of Environmental Policy Instruments (FIU), which has been set up by the German Federal Ministry for Education, Science, Research and Technology (BMBF). The analytical concept of country-specific regulation patterns has been developed and employed in the framework of this project (cf. FIU 1999, Blazejczak/Edler/Hemmelskamp/Jänicke 1999)

2. Policy style
3. Sector-specific actor configurations and related "innovation-friendly" institutional framework conditions (e.g. intra- and inter-sector policy co-ordination)

In the following, these variables are further specified in order to derive more operational indicators for our analysis.

The term *policy instrumentation* requires a *comprehensive* research perspective and refers to the whole set of policy instruments applied. The *type*, *design*, *structure* and *combination* of instruments need to be examined. Environmental policy research shows, that the intended policy effects are achieved not by a single best instrument, but by a *mix* of various instruments. Furthermore, *economic instruments* such as environmental taxes can play a crucial role both for stimulating environmental innovations and for effective *inter-sector policy integration.*

The *strategic orientation* of policy instruments is of particular importance for environmental innovations and policy performance. Ideally, policy instruments should be integrated elements of a *concise* and *comprehensive* environmental *strategy*, oriented towards clear and binding goals, instead of having the character of isolated and punctual measures.

The *policy style* can generally be defined as the mode of policy target setting, policy formulation and implementation. It implies the *forms of interaction* among the political actors on the one side, and between the state and non-state institutions on the other side. Important dimensions to be examined are the *strategic orientation* of policy making, the degree of *participation* for relevant target groups and the *conflict behaviour* of the environmental/energy decision makers (consensual/co-operative vs. authoritarian/conflict-oriented).

The *decisiveness*, *calculability*, *reliability* and *continuity* of environmental policy making are further attributes facilitating environmental innovations and policy success. A *pro-active consensual* policy style based on *dialogue and co-operation* between the state and non-state actors (e.g. by incorporating the various target-groups already in the beginning of decision-making), and among the state actors themselves has been identified as a pre-requisite for the success of environmental policies and the development of environmental innovations.

Analysing the specific *actor configurations* in the field of environment and energy requires to clarify how and with whom state institutions co-ordinate policy goal setting and policy formulation. Important issues to be considered are the *competence*, *responsibilities* and *institutional strength* of the regulating energy/environmental authorities.

Crucial factors are furthermore *intra-sector* and *cross-sector policy integration*. *Intra-sector* integration depends on the level of administrative fragmentation/concentration in policy formulation and implementation and refers to institutions of the same or different state levels (central, regional, local) within a policy field. *Cross-sector* policy integration

includes the commitment and policy efforts to *integrate* environmental issues into sector policies such as e.g. privatisation/liberalisation or fiscal policies. The openness of decision-making processes and institutional conditions providing access for relevant stakeholders and environmental innovators to policy formulation and implementation processes deserve likewise attention.

A close relationship between regulating and regulated stakeholders and the participation of target groups in goal setting promotes environmental innovations and facilitates implementation. A crucial question is whether and to what extent the affected stakeholders are incorporated (*pluralistic-inclusive* actor configuration) during the different stages of the policy process or whether policy-making is limited to one or very few actors (*exclusive* actor configuration). This requires examining more deeply the *specific relationship* between the "regulating" authorities and the regulated target groups (energy utilities, consumers, non-governmental organisations).

Core issues are the *interest profiles* of the actors, the *distribution of power* between the different stakeholders (e.g. state autonomy, balance of power, instrumentalisation of state authorities by target groups or vice versa), the *forms of interaction* between them (e.g. consensual, co-operative, adversarial, conflicting, protective etc.), the *strategies* of state institutions towards the target groups (e.g. administrative guidance and active networking, delegation or imperative command-and-control) and the strategies of the latter to influence state decisions.

Besides, close and intensive networking *among* the regulated target groups themselves (e.g. business stakeholders, scientific community, non-governmental organisations) and the creation of *innovation networks* must be considered as influential factors for environmental innovations.

The following table gives an overview of the dimensions and elements of an innovation-friendly policy framework described above. These characteristics serve as key variables for the analytical part of the chapter.

Table 9: Dimensions and elements of country-specific regulation patterns

Policy Dimension	Elements	Level of development (High, medium, low)
1. Instrumentation		
	1.1 Variety of instruments	
	1.2 Economic incentive effect	
	1.3 Strategic orientation	
	1.4 Support for process	
2. Policy style		
	2.1 Dialogue orientation	
	2.2 Reliability and calculability	
	2.3 Level of demands	
	2.4 Flexibility	
	2.5 Management and knowledge orientation	
3. Actor configuration and institutional setting		
	3.1 Policy integration	
	3.2 Networking among regulated	
	3.3 Networking between regulator	
	3.4 and regulated	
	3.4 Influence of stakeholders	

Source: Jänicke 1997

The country-specific regulation patterns and "policy profiles" can be graphically illustrated by means of multi-axial diagrams, where the individual policy dimensions and elements are arranged along respective axes.

5.4 Methodology and Proposed Structure

Methodologically, chapter 4 is based on a *policy analysis*. The dimensions and elements of innovation-friendly regulation patterns form the analytical screen of the study. The respective set of variables has been further specified by means of separate research guidelines. The analytical concept of country-specific regulation patterns is still in an explorative stage. Particularly, the process of "measuring" the innovativeness of the policy framework in the applicant countries and the employment of multi-axial diagrams is not based on substantiated quantitative-mathematical methods, but merely on a qualitative comparison of the findings from each country. Even if such an approach may be criticised from a mere methodological point of view, we consider this approach useful in order to illustrate country-specific strengths and weaknesses related to the policy framework.

Ideally, the country studies follow a three-part structure including a *descriptive* summary of the core actors, the institutional framework, the existing policies (e.g. legislation, strategic plans, action programmes), implementation practices and environmental expenditure, an *analytical* part devoted to the analysis of country-specific regulation patterns and a *concluding* section, where recommendations for further capacity-building are given. However, in order to maintain a sufficient degree of flexibility and in order to take into account the availability of information, the project partners in charge of elaborating the country reports were free to determine the final structure individually. The following section will summarise key findings from the country-studies.

5.5 Key Findings from the Country Studies

5.5.1 Czech Republic

5.5.1.1 Institutional Framework

The Czech Republic has developed a relatively differentiated and effective institutional framework for promoting energy efficiency and the use of renewable energy sources in the country.[11] On the state level, particularly, the *Czech Energy Agency* and *SEVEn*, the *Czech Energy Efficiency Centre*, a non-profit organisation, perform important stimulating, financing, co-ordinating and networking functions. The Czech Energy Agency has created a network of *Energy Consulting and Information Centres* (EKIS) throughout the country. These centres were established in co-operation with local energy consulting companies. In total, 56 of these centres existed at the beginning of 1999. Further institutions, which deserve attention, are the *State Environmental Fund* and the *Energy Conservation Fund*, which has been launched in 1997. This revolving fund is financing energy conservation measures by soft loans.

5.5.1.2 Policy Formulation and Implementation

The period up to 1992 can be characterised as exceptionally successful from an environmental policy point of view. Considerable progress has been made in terms of creating an effective institutional and legislative framework for environmental policy. Comparatively demanding and strict air pollution control legislation has been adopted in this period. The *Clean Air Act*, adopted in 1991, provided for the phased introduction of new air quality standards explicitly based on those of the European Union (Large Combus-

[11] The following summary is based on the respective country-study, which has been elaborated in the context of this project by Dr. Martin Bursik, Ecoconsulting, Prague. In addition, the following information sources were used: KPMG 1998, REC 1998, Fagin/Jehlicka 1998, Hronec 1999, Kocenda/Cabelka 1999 Sejak 1998 and the country report of the Czech Republic which has been submitted to the CTI Capacity Building Seminar for Energy Efficiency Centres, which took place in Ostritz, December 6-10, 1999.

tion Plant Directive). This led to massive investments into air pollution abatement technologies, particularly flue gas desulphurisation devices for the coal-fired power plants.

The environmental programme of the national electricity company CEZ included the desulphurisation of the total power capacity of 5,930 MW in 32 coal-firing units and the construction of seven fluidised bed boilers at four power stations. Capacity of 2,020 MW has been scheduled to be commissioned (Hronec 1999). The reduction of chief airborne pollutants achieved by the mid 1990s is certainly a result of numerous clean-up projects, that have been carried out in this period. Nevertheless, the Czech Republic still remains one of the major polluters in Europe. It cannot be overlooked, that the clean-up activities focused primarily on end-of-pipe technologies instead of integrated technological solutions. The share of renewable energy sources in the energy balance is still very low.

After the electoral success of the Civic Democratic Party in 1992, the ethos of radicalism and a rather progressive approach to environmental policy lost momentum. The period between 1992 and 1997 has been described as a period of conceptual vacuum in the field of environmental protection. Only recently, a process of "upgrading" environmental policies can be observed. In 1998, the newly elected government launched a new state programme for environmental protection. This strategy, the *State Environmental Policy*, is currently under debate. This programme formulates requirements in the field of energy use and production and emphasises the concept of sustainable development. One has to point out to the fact, that after 1992, the government's fierce hostility to the very notion of sustainable development extended as far as rejecting any references to the term within the official *State Environmental Policy* (Fagin/Jehlicka 1998). A major weakness of the programme, however, is the absence of operational targets, instruments, responsibilities, and monitoring provisions.

For the energy sector, a corresponding strategy has been recently elaborated after seven years of a strategic vacuum. The draft *State Energy Policy* was presented in mid 1999, which should have been adopted by the Government by the end of 1999. From an environmental point of view, however, this concept shows significant shortcomings. For instance, the planned ecology-oriented tax reform has not been integrated into the concept. Besides this, the proposed adjustment of energy prices has been criticised for being too moderate and slow. Further drawbacks are the planned extension of nuclear power for electricity generation and a neglect of energy conservation measures.

The Ministry of Environment together with the Ministry of Industry and Technology elaborated a *State Program in Support of Energy Conservation and Alternative Sources of Energy* including a catalogue of measures. In late 1999, the Government passed an updated version of this programme. The scope of the programme, however, is restricted by the limited financial resources (approximately USD 20 million per year). The planned amount has been considerably reduced compared to the initial target to allocate 0,01 % of GDP from the state budget. Subsidies for household energy consumption clearly outweigh those for energy conservation. In 1995, budget allocations for energy

conservation measures made for 1.7 % of those for energy consumption subsidies (Sejak 1998).

5.5.1.3 Policy Instrumentation

In the field of air pollution control, the Czech Republic has implemented mainly regulative instruments supplemented by economic instruments primarily following the pollution permit/charge/non-compliance fine model like, for instance, Poland and the Baltic countries. Revenues from emission charges have largely been earmarked into the *State Environmental Fund,* which provides grants and soft-loans for environmental investments on a co-financing basis. The introduction of tradable pollution permits in conjunction with the existing charge structure is planned for the medium-term. The Ministry of Environment and the Ministry of Finance are jointly elaborating proposals for a comprehensive and systematic ecological tax reform.

In the field of energy efficiency, policy instrumentation compares well to other transition countries. The core state actors here are the Czech Energy Agency, the State Environmental Fund, and the State Energy Inspection. The Czech Energy Agency focuses on supportive programs through state subsidies. It actively supports energy service companies. The draft Energy Management Act, includes a set of energy efficiency measures such as energy certification, third party financing, compulsory energy audits for public and private entities, labels and standards for electrical appliances and a legal obligation for heat and electricity producers to install CHP devices when reconstructing heating and electricity generation sources.

There are several *economic instruments* applied in order to stimulate the use of energy efficient technologies and renewable energy sources. These include preferential VAT treatment for environmentally sound products and technologies and income tax allowances and exemptions. Preferential purchase (feed-in) tariffs for electricity from renewable energy sources have been set up by a voluntary agreement between the Ministry of Industry and Trade, the Ministry of Environment, regional power distributors, and renewable energy associations. The proposal to set up legally fixed and guaranteed purchase tariffs has been recently rejected. The existing support scheme for renewable energy sources, however, must be considered as comparatively weak.

Economic instruments were seldom created systematically and often there exist discrepancies between the proclaimed and real functions. The *strategic orientation* of the policy instruments is not very high. The long absence of strategic concepts both for environmental and energy policies must be considered a crucial constraint. Policy instruments have mostly the character of *punctual measures* rather than being elements of a systematic and concise strategy.

The programme of desulphurising the north-Bohemian power plants is an example of the Czech government's *uncoordinated approach* to environmental management. The management of the national power utility CEZ sees desulphurisation as an unavoidable

and costly measure, which, once completed, enables the company to declare its production as 'clean'. This removes the barrier to increasing production and resuming electricity exports. A major drawback is, that this policy approach neglects the problem of CO_2-emissions. The Czech Republic has still a leading position in terms of carbon emission intensities.

In some sectors, such as the water sector, the *economic incentive effect* of economic instruments is considered as relatively high. Water effluent charge rates have approached the marginal abatement costs they are intended to trigger. The level of air pollution charge rates for SO_2 and NO_x emissions is considerably lower than the Polish or Lithuanian equivalent, but compares to the levels in other transition countries. The current rates are several times lower, than estimated average marginal abatement costs. So far, they have not been indexed for inflation. On the other side, the revenue-raising potential of economic instruments, such as emission charges, is high and almost comparable to Poland in terms of per-capita revenues. According to the *State Environmental Policy* it is planned to reassess the existing pollution charges and to consider introducing tradable pollution permits in the mid-term.

Distorted pricing mechanisms must be considered as severe drawback in the Czech Republic. The prices of households are still substantially cross-subsidised and time-of-use-pricing is underdeveloped. There is considerable state support to conventional fossil fuels. Price reform in the coal, electricity and natural gas sectors still remains to be completed. The Czech Republic is lagging behind Poland and Hungary in terms of structural and price reforms in the electricity sector.

5.5.1.4 Policy Style

A fundamental problem of environmental policies is seen in their general orientation and narrow understanding. Environmental problems are said to be basically perceived as problems of pollution which are to be resolved by scientific expertise, progress of technology and end-of-pipe solutions. Priority has been given to expensive end-of-pipe measures. There has been a lack of emphasis on sustainable development and preventive policy approaches in recent years.

Environmental policy still lacks effective integration with other sector policies and is highly selective in terms of its focus on certain separate remedial measures without due attention to their further ramifications and broader context. In contrast to the beginning of the transition period of the early 1990s, when to a large extent the environmental reform was pushed forward by domestic pressure, in the subsequent years the major factor behind it were almost exclusively systemic influences upon the Czech republic emanating from the international system, i.e. mainly from the European Union (cf. KPMG 1998).

The example of eco-labelling illustrates, that state support by accompanying measures often is too weak. Additional state-supported promotion, advertising campaigns and dissemination of consumer-oriented information were underdeveloped (KPMG 1998).

In the field of environment and energy an atmosphere of *strong competition* and *conflict* predominates between the responsible ministries of environment on the one hand, and of industry and technology on the other. The *dialogue orientation* of the respective actors involved in environmental policy-making seems to be relatively low. Participation of the public in environmental policy-making has been rather restricted between 1992 and 1997. The management and target orientation of environmental policy-making as well as its flexibility must be considered as comparatively low yet. Calculability, however, seems to be higher than in other transition countries. The intention of the Clean Air Act, for instance, was to give industry a reasonable advance notice of this change, in order to give companies time to make the necessary investments and adjustments before the implementation deadline (01.01.1999).

According to Kocenda/Cabelka (1999), the intervention of the Czech government in the energy sector is driven by lobby pressures, rather than by a consistent, clearly defined, long-term policy. Consequently privatisation is not yet complete and clear rules for entrepreneurs are still lacking

5.5.1.5 Actor Configurations

Several institutional innovations facilitating *cross-sector policy integration* can be identified for the beginning of the transition period, such as, for instance, the *Czechoslovak Federal Committee for the Environment*, which had a surprisingly progressive structure. It was not an ordinary ministry dealing with a sector, but rather a committee headed by a chairman. This institutional arrangement reflected an idea that the environment should not be treated as a particular and separate sector of government policy, but rather that environmental considerations should penetrate all government policies. Its members were ministers of the environment of both republics, deputy ministers of foreign affairs, finances and economy and also chairmen of committees of the environment (cf. KPMG 1998).

At present, there are several institutional provisions designed to promote cross-sector policy integration such as the *Commission for Sustainable Development* or casual inter-ministerial project units. Another example is the establishment of an *inter-ministerial co-ordinating commission* that would ensure the co-ordination of the Czech Energy Agency and the State Environmental Fund in implementing the *State Programme for Energy Savings and Alternative Sources*. The ministries of environment and industry and technology are responsible for the formulation of the new *Energy Act* and the *Act on Energy Use*. Institutionalised dialogue structures, however, are mostly lacking.

Some promising and innovative *procedural* efforts were undertaken to integrate environmental considerations into energy policy-making. Important to mention is the envi-

ronmental impact assessment for the energy policy strategy, which has been combined with a public hearing. A very progressive approach oriented towards an effective integration of environmental considerations into energy and fiscal policies is the proposed *environmental tax reform,* which envisages to remove of all forms of subsidies, to introduce gradually taxes on coal, liquid fuel oils, electricity from thermal and nuclear power plants and finally on natural gas and electricity from natural gas.

A major drawback, however, is that restructuring and privatisation of the electricity sector seems to be the exclusive domain of the *Ministry of Industry and Technology*. Particularly in this field, policy integration needs to be further strengthened. Price reforms, privatisation and deregulation in the electricity sector are expected to have a positive environmental impact as traditional supply structures and technologies will be challenged by modern and efficient technologies. Furthermore, privatisation and liberalisation are likely to promote the pluralisation of policy actors and to have a profound impact on established actor networks and power constellations. A competitive market is also expected to put an end to all considerations about the construction of new nuclear power plants, for purely economic reasons.

An effective legal framework for a competitive electricity market is not in place yet and the transposition and implementation of the EU Electricity Directive is being delayed. The current legislation does not provide for a fair, transparent and non-discriminatory third party access to the transmission grid. The creation of a politically independent regulatory body performing supervising functions and controlling the rules of the games of a competitive electricity market is being considered an additional institutional prerequisite for a functioning competitive market.

In the electricity sub-sector, the vertically integrated national electricity company CEZ, which is the dominant electricity producer, exerts an extraordinary and strong influence on energy policy-making, which remained almost untouched during the past ten years. The utility still enjoys considerable autonomy and benefits from information asymmetries. It has still got the characteristics of a "state in the state". The role of the state as shareholder, regulator and policy-maker must be considered a structural weakness.

The country-study gives an excellent insight into the close, symbiotic relationships, interdependencies and personal entanglements between the Ministry of Industry and Technology and CEZ, which are deeply rooted in the socialist period. It includes a detailed analysis of the decision-making process referring to the construction of the *Temelin* nuclear power plant and reveals the strategies employed by the core actors in order to achieve the completion, despite compelling economic reasons questioning the project.

The country-study convincingly demonstrates the inability and unwillingness of the ministry to effectively supervise the utility. Furthermore, it pointed out to the political reluctance to accelerate the process of profound restructuring, privatisation and liberalisation, which has been consecutively postponed. So far, the Ministry of Industry and

Trade obviously assumes a *protective* position toward CEZ and rather attempts to strengthen the monopoly of CEZ.

Due to the enthusiasm and effort of the first Czech Ministry of the Environment and the *Federal Committee for the Environment*, close contacts with the international environmental community were activated immediately after these institutions were established. This was a good basis not only for the onset of mutual information exchange, but also for the financial and expert assistance (KPMG 1998).

A remarkable feature of the first 'enthusiastic period' after 1989 was the close relationship between state officials and activists from non-governmental environmental groups. In 1990, the *Czech Minister of Environment* initiated the establishment of a "Green Parliament", a forum consisting of representatives of almost all environmental groups serving as a consultative body. The first ministers had a relatively strong political weight, particularly during the enthusiastic period.

Since 1992, however, the *Ministry of Environment* suffered from its declining authority and influence. This was accompanied by a changing relationship between the ministry and non-governmental environmental associations during the 1990s. The initial open, and dialogue-oriented policy style of the ministry, which has been typical for the "enthusiastic period" between 1989 and 1991 has completely changed after 1992. Pluralistic-inclusive participation patterns have been succeeded by rather exclusive participation patterns. In general, a considerable democratic deficit in terms of the capacity of citizens to influence decision-making in the sphere of environment has been criticised.

However, whilst the relationship between associations and the ministry has quite clearly deteriorated, the ability of larger associations to forge links with deputies from opposition political parties appears to have improved (cf. Fagin/Jehlicka 1998). Particularly, in the case of the completion of the Temelin nuclear power plant, established environmental NGOs were, with few exceptions the only partners in the limited dialogue with the Government. Apart from forming the major opposition against the completion of the power plant, NGOs were involved in a number of energy projects.

In the field of energy conservation, impressive progress has been made in terms of institutional capacity building and networking. An adequate institutional infrastructure has been developed in the recent years. The Czech Energy Agency has created a rather dense network of regional energy centres performing networking functions between the various stakeholders.

5.5.1.6 Conclusions

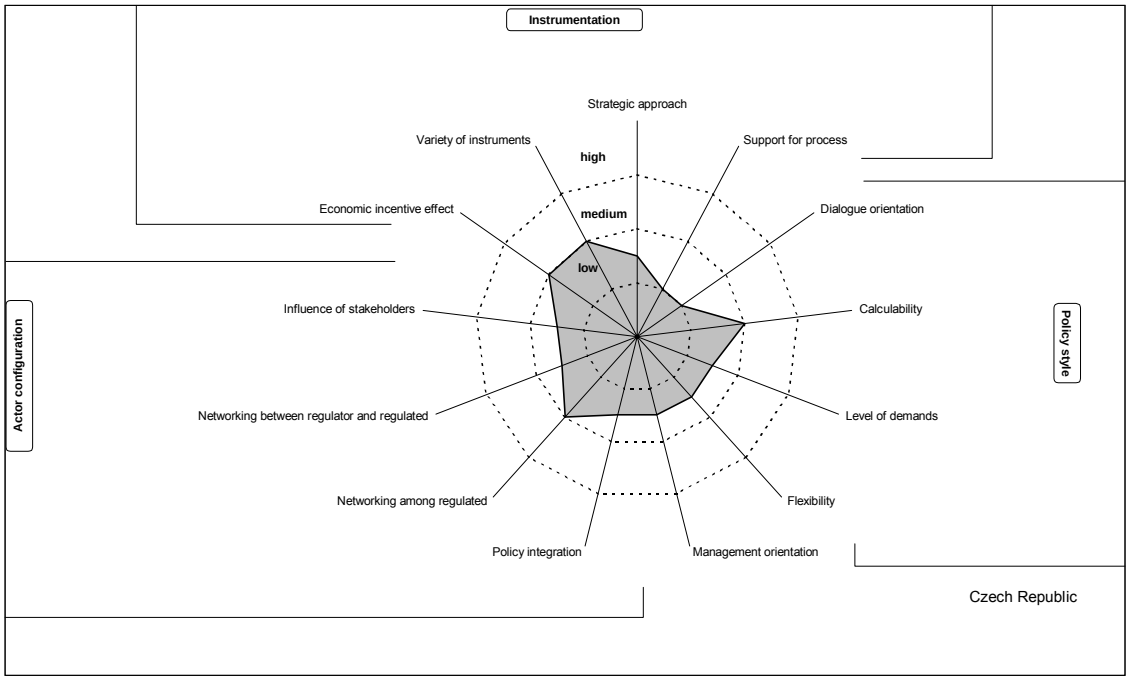
The country report does not explicitly formulate proposals for further capacity building. The analysis revealed major constraints in the field of strategic orientation, dialogue orientation, and policy integration. A severe drawback are the distorted pricing mechanisms. The comparatively well-developed institutional infrastructure in the field of en-

ergy conservation offers favourable possibilities for further capacity building in this field through networking instruments.

The existing network of regional and local energy centres needs further stabilisation. Co-operation between the energy efficiency institutions of the different state levels should be intensified and strengthened. Municipal energy planning, project monitoring and post-implementation evaluation deserve special attention. The local energy centres form important crystallisation points for intensified networking on the municipal level. The establishment of a project identification and co-ordination facility might be considered.

The creation of innovation networks incorporating the education and science sector, business and public administration should be supported. In order to facilitate cross-sector policy integration, the environmental tax reform requires effective back up. In addition, inter-ministerial project units for the restructuring and privatisation of the electricity sector might be established.

Figure 14: Regulation Pattern of the Czech Republic



5.5.2 Estonia

5.5.2.1 Institutional Framework and Policy Developments

Major structural weaknesses of the Estonian energy system are an unbalanced fuel structure and an oversized techno-structure, particularly in the electricity sector. The Estonian energy sector has been integral part of the Soviet energy system and the infrastructure was designed to serve rather regional than republican needs. 98 % of domestic electricity generation in Estonia are based on oil shale combustion. The share of oil shale in the primary energy balance is 60-65 %. Mining, processing and combustion of this low-grade fossil fuel are regionally concentrated and have a severe environmental impact, being also a major source of trans-boundary air pollution. The high mineral carbon content increases the carbon emission factor of oil shale and the specific CO_2 emissions.

From a resource and climate protection point of view, consequent restructuring and down-sizing of the oil shale mining and power complex, the closure of mines and decommission of obsolete, superfluous electricity generation units, a pronounced shift to less polluting fossil and renewable energy sources (wood, wind), and particularly, a systematic energy conservation policy should gain priority in Estonian energy policies.

One has to bear in mind, that the Baltic countries after regaining independence faced the challenge to establish at first the fundamental institutions of sovereign national states. Several actors perform public energy management functions in Estonia. However, the institutional capacities for the promotion of energy conservation measures and renewable energy sources are underdeveloped. The current institutional structure is insufficient. Estonia does not have an energy (conservation) agency or comparable energy efficiency institution on the central state level, as do many other transition countries. Such an institution could perform important co-ordinating and networking functions. Climate protection tasks need additional institutional support. Promising capacity-building measures on the local level include the foundation of three regional energy centres and the development of an investment preparation facility for regional development and energy planning. These initiatives are supported by the EU PHARE Programme.

The state-owned oil shale mining and oil shale based electricity supply industry could maintain a dominant position in the energy policy arena. A regulatory body has been established under the Ministry of Economic Affairs (*Energy Market Inspectorate*). Policy-making and regulatory functions have been institutionally separated. The political and financial independence of the *Energy Market Inspectorate*, however, has to be considered as comparatively weak.

Concerning the electricity sector, consequent deregulation and liberalisation policies combined with supporting environmental measures are expected to have positive environmental effects as this would facilitate the entrance of new players as well as modern and efficient technologies into the market. Estonia has already taken initial measures regarding the transposition of the respective EU Electricity Directive. Since 1996, the

privatisation of the vertically integrated state-owned joint stock company *Eesti Energia* is on the political agenda. The company has formally introduced unbundling of financial accounts in 1999.

However, core elements of the EU Directives, particularly the principle of non-discriminatory *third party access* to the transmission network have not been concretised and need further elaboration yet. Compared to initial privatisation concepts, the current approach of restructuring and ownership transformation in the oil shale mining and electricity sector shows significant differences. Since 1998, there can be observed a pronounced shift in the restructuring and privatisation policy of the Government. Only two small distribution networks were privatised in 1998.

The degree of vertical integration is now going to be even increased rather than decreased, oil shale mining and electricity production shall be amalgamated into one single value chain, and the vertically integrated, state-owned utility *Eesti Energia* aspires to integrate the transmission and the remaining distribution networks into one single network company. Quite recently the Estonian Government and the US company *NRG Energy*, with whom the Government is exclusively negotiating on the privatisation of *Eesti Energia*, have concluded an agreement under which the state will secure a market for the entire output of the oil shale based power stations by a wholesale agreement. The leading rationale is to stabilise the decreasing competitiveness of oil shale based electricity, to preserve the economies of scope and scale, and to increase electricity exports to neighbouring countries.

Estonia is well advanced in designing an environmental strategy for the pre-accession period. The National Energy Strategy and the National Environmental Action Plan provide a solid and operational policy framework for the energy sector. Policy monitoring and implementation, however, need to be adequately supported. Fore and foremost, these policies have to be matched with corresponding energy sector policies and action programmes. So far, environmental and energy policy-making have been rather segmented and insulated from each other.

Until 1998, the energy sector has been characterised by an absence of a comprehensive and consistent long-term development strategy or policy. The recently adopted *Long Term Development Plan for the Estonian Fuel and Power Sector* is hardly to overcome this drawback. This plan must be considered a rather weak policy framework lacking sufficient operational targets and priority setting. An *integrated* strategy equally matching environmental challenges with other energy policy targets (restructuring/privatisation, security of supply etc.) is still missing. Estonian energy policy is heavily supply oriented and there is a bias emphasising the strategic importance of the oil shale sector. Environmental commitment by energy policy-makers is rather low. Environmental problems are mostly seen as technological challenges.

Oil shale seems to remain the dominant fuel for the short and medium term in Estonia. Restructuring of the oil shale mining and oil shale based electricity sector is a highly complex task. Such an effort requires a balanced problem-solving approach equally ad-

dressing the environmental, socio-economic, and regional challenges. *Regional* policy approaches, which have been already partially endorsed during the transition period (cf. *Programme of Sustainable Development of the Ida-Viru County*) should be reinforced and combined with an engagement of international financing organisations. Multipartite actor configurations incorporating the relevant stakeholders facilitate the efficiency and effectiveness of sector restructuring.

5.5.2.2 Environmental Expenditure

Estonia has been particularly successful in attracting foreign assistance with some 35 - 40% of environmental investments financed by international grants and loans, compared with an average of below 15% in the CEE countries. In 1997, Estonia ranked first among CEE countries in terms of per capita financial assistance to the environmental sector.

The *water sector* still absorbs the major share of environmental expenditure in Estonia. 80% of annual environmental investments are channelled into the construction of new municipal wastewater treatment, treatment plants and associated sewers. Domestic investment in air pollution control technology is rather low. Some industrial plants, however, such as the *Kunda Tsement* factory, have made considerable investments after privatisation. Total environmental expenditure for air pollution control is not known. In other transition countries, as for instance Poland or the Czech Republic, a considerable share of environmental investments goes for air pollution control measures.

In the electricity, gas, steam and hot water supply sector, end-of-pipe technologies have been clearly dominating so far. Environmental investments in the oil shale fired power plants comprise exclusively end-of-pipe measures (50 MW flue gas desulphurising test unit, installation of two ash precipitators). There is a rather broad consensus among policy-makers, the domestic business and scientific community that replacing the conventional pulverised combustion technology in the oil shale combusting power plants by more efficient and less polluting atmospheric or pressurised fluidised bed combustion is the most suitable strategy to achieve compliance with the environmental requirements set by the respective EU Directives and further international environmental agreements. Preparations for the refurbishment of one 200 MW unit and the installation of a flue bed combustion boiler have recently started. These technologies, however, are highly expensive and generate additional waste problems.

Particularly during the first years of transition, a considerable part of foreign loans and grants has been absorbed for financing fuel purchases energy supply measures. Generally speaking, the Estonian Government can be characterised as comparatively “conservative” and reserved in terms of its borrowing activities. Several accounts as the EBRD loan have not been used up to the full amount originally foreseen.

Some progress has been achieved with regard to the rehabilitation of DH systems and the conversion of heat-only-boilers from to local fuel burning (mainly wood). This was

supported by several foreign assistance programmes and loans (World Bank, EBRD, Swedish EAES Programme etc.). However, most of these activities have concentrated on the *supply side*. The end-use sector has been neglected so far, but bears a vast potential for cost-effective conservation measures. Allocations in this area have been made mostly for the installation of metering equipment and devices. Supporting organisational and financing instruments are heavily needed in this area.

Numerous projects have been financed through multilateral and bilateral foreign assistance. A fundamental problem is that only modest amounts of the state budget are made available to implement energy efficiency measures. The budget of the Energy Conservation Programme has been considerably reduced since 1995. Complementary financing mechanisms are required.

The *Estonian Environmental Fund* re-shifts financial resources from the energy sector to other sectors in form of pollution charges, non-compliance fines and resource taxes. On the other hand, energy efficiency and climate protection are not a financing priority of the Fund. The re-distributive effect has been substantial so far and additional resources should be earmarked for air pollution control and energy conservation measures. The main advantage of such extra-budgetary funds is that they do not compete with other sectors and programmes for limited state resources.

The Environmental Fund could serve as an effective instrument allowing for an effective integration of environmental and energy policies. It is rather difficult to assess the real performance of this institution and local decision-makers criticise severe transparency and control deficits. The establishment of an extra-budgetary energy saving/conservation fund as it has been set up in other transition countries (e.g. Slovenia, Lithuania, Latvia) should be considered. In order to reduce transaction costs, its functions could be likewise managed by a reorganised Environmental Fund.

5.5.2.3 Policy Instrumentation

Compared to other transition countries, the *variety* of policy instruments for environmental protection in the energy sector is rather low. The dominant instrument type in the field of air pollution control is command-and-control instruments with economic instruments performing complementary functions. Particularly with regard to energy conservation and promotion of renewable energy sources, the policy mix needs further diversification. So far, fiscal instruments are dominating. The *economic incentive effect* of resource and air pollution charges has been quite low so far, but shows increasing tendencies. The share of these charges in the oil shale and electricity production costs is still rather small (at present 0.5-2%). However, the recent introduction of a (very low) CO_2 emission charge and constantly increasing rates of other air pollution charges levels make environmental costs increasingly perceivable to the energy producers, due to the massive amount of emissions.

Estonia has made some progress in removing price subsidies and achieving cost recovery. There are no direct price subsidies for oil shale mining and cross-subsidies between households and industry have been partially removed. The electricity price level is the lowest in Europe, but in the recent years there have been considerable real price increases.

The *strategic orientation* of environmentally oriented policy instruments must be considered low so far, but is increasing after the adoption of the National Environmental Action Plan. Continuous reorganisations of the ministerial apparatus lack of qualified staff, lacking resources and capabilities in the ministries and a high civil service turnover, which is the result of the low level of wages in the public sector are crucial drawbacks. Only recently have environmental and energy sector policy strategies been endorsed. The current energy sector strategy lacks sufficient implementation orientation. Policy monitoring and post-implementation evaluation are generally underdeveloped.

Despite the energy conservation program, energy conservation measures are rather based on a *haphazard* approach. There has not been any systematic, target oriented energy conservation policy so far (not to speak of any systematic climate change mitigation policy). The recently adopted introduction of a CO_2 emission charge is a promising approach, but this instrument has more the character of an isolated measure, than being an integral part of a systematic and consistent energy efficiency or climate change mitigation policy. With regard to co-generation and renewable energy sources, domestic experts criticise governmental *abstinence* and a *laissez faire* approach.

5.5.2.4 Policy Style

Environmental policy-making in the Estonian energy sector is rather legalistic, hierarchical and mostly *reactive*. Likewise, the *reliability* and *calculability* of policy-making must be considered poor. Further characteristics are a rather *technocratic* way of environmental policy-making. There are, however, perceivable differences between the Ministry of Environment and the Ministry of Economic Affairs in terms of their *dialogue orientation* and the degree of *participation* of stakeholders in decision-making processes. Whereas environmental policy formulation practices under the domain of the Ministry of Environment show increasingly *inclusive* participation patterns, participation in energy related policy development is still rather *exclusive*. Particularly, restructuring and privatisation of the energy sector is a highly closed and exclusive decision-making process.

5.5.2.5 Actor Configurations

Environmental and energy policies require more co-ordinated efforts. In the period between 1993-1995, Estonia has developed several promising legislative, institutional and planning tools in order to overcome segmented sector decision-making and promote cross-sector policy integration. However, these provisions and instruments remain rather weak in fact and policy integration in the area of environment and energy is still a major

drawback. Environmental commitment is rather low in the Ministry of Economic Affairs. Inter-ministerial co-operation is rather poor, particularly on higher administrative levels. There is still a lack of an *integrated* energy policy matching economic targets and demands (security of supply, price policy, restructuring and privatisation) with environmental and resource protection requirements.

Due to its small size, Estonia has good preconditions to develop well co-ordinated and effective policies and to overcome fragmented and insulated decision-making both between different actors within a certain policy area and between actors of different administrative state levels. *Intra-policy co-ordination*, however, suffers from decreasing resources and capacities both on the central state level, and particularly on the local/municipal level. The absorption of qualified staff and experts from the private sector is a very serious problem.

The establishment of three regional energy centres by the EU PHARE programme is a promising step, but their functions are rather limited including mainly advisory tasks. The future development of these centres is insecure and the absence of a corresponding co-ordinating institution on the central state level is perceived as a crucial weakness. The example of the other applicant countries shows, that energy agencies perform crucial networking and co-ordination functions in the field of energy efficiency. Networking between the various stakeholders and potential innovators is rather weak.

5.5.2.6 Conclusions

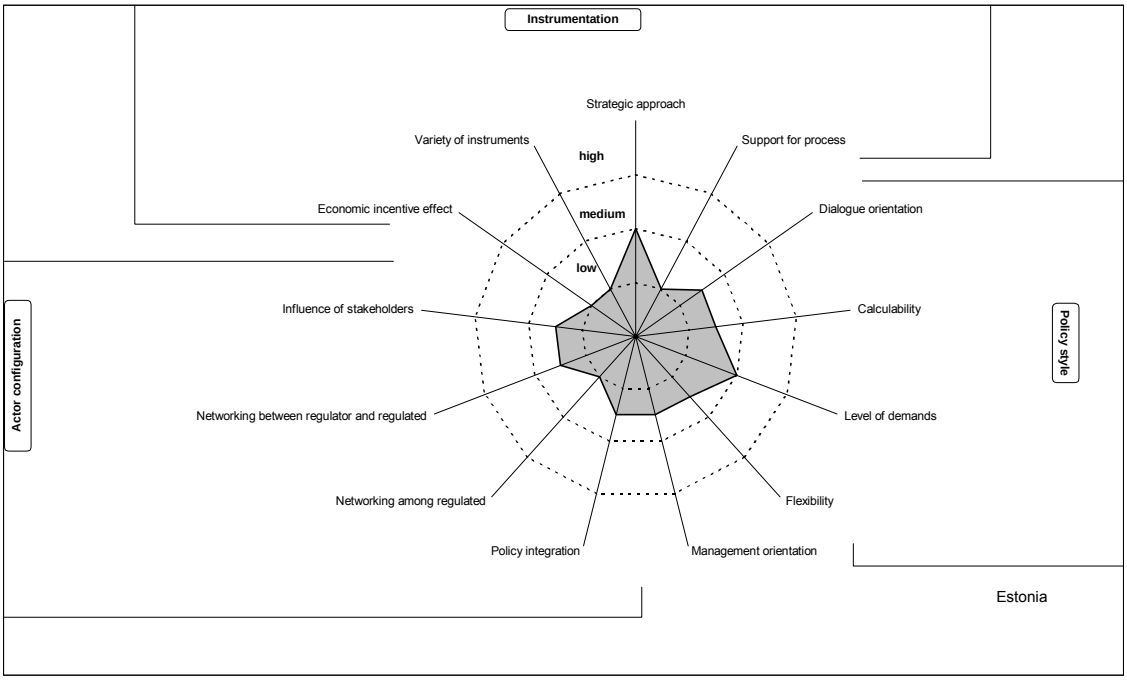
The current institutional framework for energy conservation and climate protection is inadequate. The interviews clearly revealed that a *public institution* for guiding energy saving activities is needed on the *central state level*. This institution should be relieved of daily administrative tasks and enjoy sufficient freedom of action. This institution could perform important co-ordination and networking functions.

Local experts recommend the establishment of a separate energy conservation/efficiency fund which could be co-financed by the state budget and a part of the pollution charges. This organisation could support research programmes, soft loans, regional energy conservation plans, energy audits and energy saving campaigns. The Environmental Fund, a respective reorganisation of this organisation provided, could also perform these functions. In any case, measures should be undertaken oriented to re-shift a part of the pollution charge revenues for energy conservation projects.

Numerous small-scale energy investment projects have been implemented in Estonia since 1991. However, the targeted energy saving objectives have not always been achieved and a recent post implementation analysis of selected energy (conservation) projects which have been mostly implemented with foreign assistance draws a critical picture. Another drawback is, that the bulk of projects focus on the supply side. State support for utilising the vast energy conservation potential in the end use sector is very weak. Additional financing mechanisms need to be developed. In order to strengthen

policy implementation, the introduction of performance monitoring procedures and post implementation evaluation policies should be secured.

Figure 15: Regulation Pattern of Estonia



5.5.3 Hungary

5.5.3.1 Legislative and Institutional Framework

Hungary[12] became the first country in the region to start the long process of creating the legislative and institutional framework for privatising the energy industry (approximately 10% of the electricity market will be open to competition by Januarary1, 2001), expecting that this would allow to reduce the huge foreign debts and attract foreign investors who would modernise the old power plants.

Energy and environmental issues are intermingled in complex ways and should be jointly integrated into specific sectoral policies, unfortunately this is not the case in Hungary.

[12] This summary is based on the respective country-study, which has been elaborated by Zsolt Boda, Energy Club, Budapest.

Two areas are given here detailed attention: that of environmental regulation focusing on air pollution, and of the energy generating (electricity) sector as well as of energy efficiency and saving policies.

The legislative and institutional framework for energy policy in Hungary aimed at establishing a competitive, market-oriented energy sector in Hungary. The Parliament accepted the new *Energy Policy* in 1993, which created the framework for privatising the energy industry, but failed to create an accompanying Energy Framework Law, which could have provided a conceptual basis for implementation. Several specific bills necessary for an institutional background for privatisation were passed by the Parliament: the *Gas and the Electricity Acts* (1994), the *Nuclear Act* (1996), and the *Act on District Heating* (1998). The adoption of the *Act on Environmental Protection* (1995) followed the Gas and Electricity Acts, so the privatisation process of the energy sector started without a proper environmental strategy. The Gas Act established the *Hungarian Energy Office* as the new gas and electricity regulator, headed by the Ministry of Economy (the former Ministry of Industry and Trade), which is responsible of licensing and operative regulation of the gas and electricity industry, for general consumer protection, and for promotion energy efficiency.

Hungary's energy profile is determined by only scarce mineral resources of rather low quality brown coal, gas, and oil, and by the use of nuclear energy since the 80s. Half of the country's primary energy demands are supplied by imports. Energy efficiency is increasing, but the energy intensity is still 2 to 3 times higher than in Western European countries.

Energy and environment: The most important environmental problem associated with energy is air pollution. Total SO_2 emissions are about 650 000 tons per year, of which 540 000 are produced by the energy sector, and they are among the highest per capita emissions in the region. CO_2 emissions are 7 tons per capita, which is below the OECD average. The energy sectors share amounts to one third of total CO_2 emissions.

Nuclear energy represents about 40% of electricity and 12% of total energy consumption in Hungary. Official lifetime of the four reactors is expected to end around 2010, by which time the phase out plan to replace this capacity should be ready. There are plans however to postpone the lifetime and even expand the existing nuclear power plants. In 1996 the new Nuclear Act established the Central Nuclear Financial Fund, which is weakly regulated being dependent on the yearly budget discussion of the Parliament and showing no transparent spending procedures. Since the Russian Parliament in 1993 passed a law, which banned the taking back of spent nuclear fuel from the former socialist countries, the Hungarian government and Paks NPP have been negotiating about the possibility and price of placing the spent fuel at Mayak every year. So Hungary is in the need to find a solution for permanent storage of nuclear wastes.

5.5.3.2 Policy Formulation and Implementation

Regulation patterns in Hungary follow the energy and environmental policy principles, formulated in the Energy Policy from 1993 (legal acts on gas, electricity, nuclear power, and district heating) and in the National Environmental Programme 1997-2000 (adopted in 1997 and based on the Act on Environmental Protection from 1995), which formulates as principles: sustainable development, the precautionary principle, the principle of prevention, partnership defined as participation and subsidiarity, and stewardship. In July 1999 the Ministry of Economy published a paper on „Foundations of Hungarian Energy Policy and the Energy Market Model" which presents the strategic orientation of the governments energy policy and will serve as a basis for a governmental decree on the topic.

Implementation is the weakest part of environmental policy referring to both energy and environment issues. So the lack of a constant political will to promote energy efficiency has certainly contributed to its slow and insufficient implementation. Furthermore, there is no sole responsible body in state administration to co-ordinate energy efficiency measures, no regional agencies exist which might take care of local energy efficiency programmes and serve as consulting centres. Communication problems within the state administration are i.a. caused by a lack of consistency on the strategic level and the problems of integration on the policy making level. Inter-ministerial committees on energy and environment issues do not exist, eventually gathering groups work on an *ad hoc* basis.

5.5.3.3 Policy Instrumentation

Instrumentation as shown e.g. in the currently discussed National Energy Saving and Energy Efficiency Programme is based on an instrument mix including standards (on building insulation), positive incentives (providing preferential credits and investment supporting schemes), awareness raising (through dissemination of efficiency information, education, training), and economic incentives (least-cost planning, elimination of price subsidies), positive incentives apparently receiving priority. With promoting energy efficiency in transport, agriculture, residential sectors, and increasing the use of renewable energy sources from the presently 3 to 5% by 2010, the basic objective of this programme is to save 7% of the current energy consumption by the same year.

Air quality regulation uses command and control systems like standards and fines for non-compliance of these standards. The already mentioned 22./1998 (VI.26) Decree of the Ministry of Environment demands that EU conform air quality standards be met by all power plants by January 1, 2005. Quality and environmental standards of gasoline have been improved in the past years and do meet the EU requirements.

Economic instruments are being applied, e.g. there is a product fee levied on gasoline and built into the gasoline price, but since it amounts only to 5%, it is not able to reduce consumption, but rather aims at raising funds for environmental investments being one of the greatest sources of the environmental fund managed by the Ministry of Environ-

ment. To date the introduction of an environmental emission fee system on air, water, and soil is planned by the same ministry, primarily concerning the energy sector with air emission fees on SO_2, NO_x, CO, particles, and other toxic emissions.

5.5.3.4 Policy Style

The Policy style in Hungary referring to energy issues was in the 80s largely shaped in informal co-ordination and bargaining processes between the main actors (Ministry of Industry and MVM), integration into other policy areas did not exist. Tools of public policy analysis, like evaluation of alternative decisions according to multiple criteria, were rarely included. Although the institutional and political arena has changed respectively disappeared, some elements of the old system still characterise in some ways current energy policy-making. So are some of these elements related to the lack of appropriate institutional arrangements like the low level of cross-sectoral integration, others only slowly evolving cultural patterns like the role assigned to hearings and other means of public participation (which are treated more as barriers to, and less as constitutive elements of decision making processes), still others to subsisting personal relations like forms of informal lobbying and bargaining.

Policy evaluation reveals that Hungarian energy policy has a well enough designed architecture, i.a. acknowledged by the country report of the European Commission from 1995, which stated that the strategic orientation of Hungary's energy policy is in harmony with that of the European Union. Furthermore, Hungary is to date the only CEE country, which became a member of the International Energy Agency, meaning that it meets the IEA's complex requirements in terms of energy policy, regulation, safety, and environment.

Environmental policy does not seem to be equally well developed to date, since it shows rather little integration into sectoral policies and a lack of internal consistency. So in spite of formulation of sustainable development and the precautionary and prevention principles as obligatory objectives, there is no connection made with greenhouse gas emission mitigation. No approved governmental programme exists either concerning this issue. It is assumed that Hungary will meet its international obligation according to the Kyoto Protocol from 1997, to reduce CO_2 emissions at 7% by 2012 compared to the average emissions of the years 1983-1987 due to the economic recession and related energy consumption drop and to increased energy efficiency induced by further structural and technological change in the economy.

5.5.3.5 Actor Configurations

Actors and institutions in the energy sector show some difference to other CEE countries. Since the energy sector has been almost completely privatised, there are no monopolistic structures preserved, that means, that many actors are present in this arena. So currently MVM (national electric utility), MOL (national oil and gas company), foreign investors and owners of plants and distribution facilities (French, Germany, Belgian,

and Italian) as well as of district heating plants, are in the transformation process. Their ownership structure is as follows:

- The state holds 50% plus one share of MVM, the rest of capital assets are held by small domestic investors and domestic and foreign institutional investors. MVM owns the National Grid Company, the Paks Nuclear Plant and the Vértes Power Plant. It has long-term contracts with power plants and is obliged to purchase electricity from them at prices fixed by the Hungarian Energy Office.
- 50% plus one share of the generating companies were sold to strategic, mostly foreign investors (RWE Energie AG, EnBW AG, Rheinbraun, AES Summit Generation Ltd., Tractabel, Fortum-TOMEN).
- Less than 50% of the shares in the regional gas distribution companies and regional electricity utilities were sold to foreign investors (EDF Internationale, Bayernwerk AG, Isar Amperwerke AG).
- The state holds a 25% share of MOL blocking minority shareholding. 30 to 35% of the shares were sold to small domestic investors and to the Bank of New York. Although oil trading is liberalised in Hungary, MOL is by far the biggest oil trader (in Central Europe) and has a monopoly in gas trading.
- The Hungarian district heating sector is presently undergoing great changes. There are several hundred district heating companies throughout the country underlying the privatisation process, which is according to the new District Heating Act (1998) a possible task of municipalities.

The *executive apparatus* contains the Ministry of Environment, Ministry of Economy, the Hungarian Energy Office, the Hungarian Atomic Energy Agency and Commission, Regional environmental authorities, and other governmental bodies like Energy Centre, and Energy Information Agency.

According to the 22./1998 (VI 26) Decree of the Ministry of Environment, power plants have a five year period (until January 1, 2005) to comply with EU air quality standards. Environmental investment costs have to be approved by the Hungarian Energy Office in order to be built into the energy price. The planned environmental emission fee and its possible effects on energy prices is another question concerning ministries of environment and of economy.

The Ministry of Environment has no department dealing with energy issues. It has played no major role in shaping energy efficiency and energy saving policies, which have been totally taken over by the Ministry of Economy. Environmental Ministry's activity concerns the energy sector through environmental regulation (air, water waste, etc.), which aims to be EU conform in the coming years.

The Energy Centre is a semi-governmental body with the main task of administering energy efficiency programmes and projects. Since it is a small and politically quite weak organisation, it is questionable whether it will be able to influence and mobilise other

ministries like the Ministries of Transport and Agriculture towards an increased attention for energy efficiency.

The Energy Information Agency collects energy data, but no environmental data related to the energy sector. Lacking transparency is certainly also due to the decreasing willingness of privatised energy companies to provide the Agency with their data.

Regional Environmental Authorities are in charge of implementing environmental policy measures. They have a monitoring and sanctioning function and thy collect environmental fines when environmental standards are not met. But their strength and competence is severely limited by insufficient resources guaranteeing e.g. regularly realised monitoring.

Local governments can be considered as weak players in the energy-environment field. They do not have owner rights over energy utilities except the ownership of some of the district heating plants and some shares in the regional gas distribution network, and it seems that they are presently loosing control over the pipeline. So „Stadtwerke"-type local energy utilities do not exist in Hungary, which means, that subsidiarity is missing in this area. The relative weakness of local governments is also due to the fact, that they are working separately and not in useful networks, which makes them unable to represent themselves in a well-organised, unified way. Local governments do not seem to use their rights to impose stricter environmental quality standards on power plants or strict requirements for new constructions. They are recipients of some energy efficiency support like e.g. the Energy Saving Credit Programme.

Large energy consumers like district heating plants are organised in the *Association of Hungarian Energy Consumers*. Their concerns are closely linked to the energy sector's and do not represent real consumer interests. However, business as such should be interested in energy efficiency issues and demand side management and might support further deregulation of the energy sector. An important future task of environmental NGOs might be to build coalitions with those business players who are potentially interested in energy efficiency and the spread of renewables.

Particularly remarkable is the great activity of banks in financing energy efficiency programmes even if no direct benefits were guaranteed, which is explained by the sharp competition in Hungarian banking sector to reach more potential clients.

NGOs and other civil organisations are very active in this arena, compared to several other countries in the region, but still underdeveloped and weak in comparison to Western countries.

Concerned with energy issues are several NGOs, like e.g. the Energy Club, the Clean Air Protection Group, the Pécs Green Circle, E-Mission, the Energy and Environment Foundation, the Green Action, Reflex, and Göncöl. Co-operation among environmental NGOs is organised through the *Green Energy Network* which includes 12 NGOs and is co-ordinated by the Energy Club. They are mainly dealing with awareness raising campaigns and demonstration projects in their local area. Active in lobbying, policy making

and legislative work are only the two in Budapest located organisations, i.e. the Energy Club and the Clean Air Action Group, the latter having been commissioning the publication of „Green Budget Proposals“ promoting a green tax reform with a tax on energy consumption.

Academic organisations, universities, think tanks, and consulting firms have been dealing with energy and environment issues, including the departments of Environmental Economics and Technology of the Budapest University of Economics and the Technical University of Budapest, as well as the Department of Environmental Sciences and Policy of the Central European University, and others. They have been elaborating papers to back-up the government's energy efficiency programme and also a concept for an emission trading system among power plants.

Coalitions and interactions will definitely be needed particularly between NGOs and the business sector focusing on electricity companies and Chambers of Commerce and Industry, in order to promote energy efficiency and demand side management. Another important ally would be the administration, since energy efficiency has no effective lobby in the political arena, and the lack of inter-ministerial and inter-sectoral integration has contributed to the relative weakness of energy efficiency policies. To date co-operation between the administration and NGOs is rather sporadic.

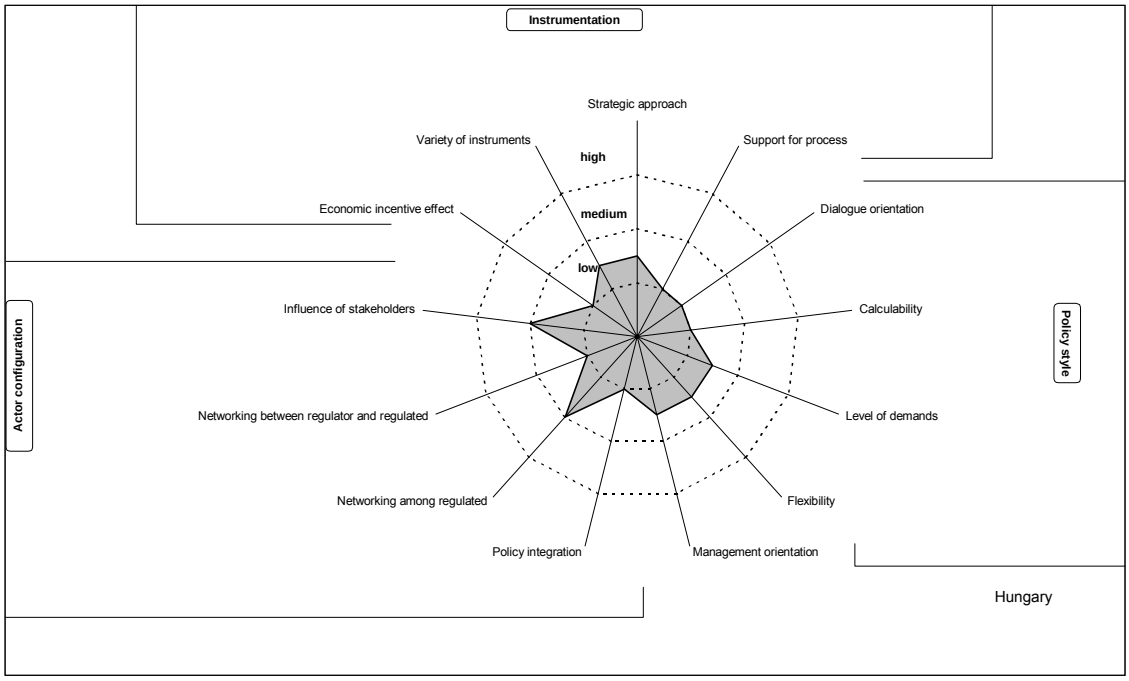
Hungarian policymaking is not dialogue-oriented and public participation is not well institutionalised. Institutions concerned with this issue like the National Council of Environmental Protection as well as the Industrial and Commercial Council of the Ministry of Economy are very inefficient in practice, so the energy sector in many cases is more effective in lobbying.

5.5.3.6 Conclusions

From a critical point of view it can be argued that *strategic orientation* of Hungarian energy and environmental policy definitely should be improved, since a well-elaborated long-term strategy, which would build on clear principles is missing, because otherwise it will remain a follower in Europe. *Calculability* is rather low considering the chances of introduction of a green tax or energy tax etc. *Policy instrumentation* is poor, but might have a chance to improve, once policy measures like an emission permits trading system and environmental emission fees as well as positive incentives will be implemented. *Dialogue orientation* is low, since evidence suggests that communication is difficult even within the state administration and public participation is not well institutionalised. *Subsidiarity* is missing, for energy and environmental policies are still centralised, no local agencies promoting energy efficiency projects exist. *Pro-activeness* is to be seen partially, so e.g. in the new National Energy Efficiency Programme and in the considerations referring to introduction of environmental emission fees and a green tax reform.

Capacity building proposals are not formulated in the policy analysis concerning Hungary. However, as it is shown in the conclusions to this summary there are widespread possibilities for support for activities, which would promote networking between different stakeholders in energy and environmental policy arenas. To date only environmental NGOs succeeded in establishing a stable and well-functioning network, which allows co-operation all over the country. There is definitely a need to build networks also between NGOs and business as well as between the state administration and NGOs, and also to strengthen and extend already existing connections between state administration and the scientific community in order to create and implement innovation-friendly, dialogue-oriented, calculable and reliable politics in the field of environment and energy.

Figure 16: Regulation Pattern of Hungary



5.5.4 Poland

5.5.4.1 Legislative and Institutional Framework

The basic legal framework of the Republic of Poland provides the fundament for the development and implementation of various policies and measures targeting at improvement of the environment:

The *Constitution of the Republic of Poland* from October 1997 refers directly to sustainable development protecting independence, guaranteeing freedoms and rights and en-

suring environmental protection in order to provide ecological safety to the present and future generations. It settles rights and duties of individuals and as well of public authorities in order to secure the protection of environment, human health, and biological diversity.

The *National Environmental Policy* from 1991, presently being revised in order to consider new socio-economic conditions occurring i.e. with the EU integration process, is and also will be in the future the fundamental document for all further policies in the area of environmental protection. Various legal acts concerning environmental issues like e.g. the *Act on Protection and Shaping of the Environment* (1980; last amendment 1998), the *Act on Nature Conservation* (1991), the *Act on Spatial Management* (1994), the *Act on Protection of Agricultural and Forest Land* (1995), the *Act on Energy Economy* (1997), and the *Act on Environmental Impact Assessment* (1998), are of crucial importance as well. The establishment of the *Energy Regulation Authority* in 1997 created an agency with most important tasks like i.e. the protection of consumers' interests against non-justified levels of energy prices and integration of energy and environmental policies.

In bilateral and international agreements Poland co-operates with neighbouring countries and on a global level. Most important in the area of climate protection policy are the Geneva Convention on Long-Range Transboundary Air Pollution (1979) with following Protocols, the Vienna Convention for the Protection of the Ozone Layer (1985) with Montreal Protocol on Substances Depleting the Ozone Layer (1987), and the UN Framework Convention on Climate Change (1992) with Kyoto Protocol (1997).

To date national total emission reduction targets do not exist in Poland, but with the ongoing law harmonisation process European emission standards for air pollutants will become obligatory for Polish emission reduction policy, when EU directives concerning air quality improvement have been incorporated into Polish legislation and will be implemented.

One of the major future tasks of climate protection policy will be the enhancement and improvement of monitoring air pollutants.

Institutional setting and implementation structure are currently influenced by the spatial reform enforced in January 1999, which changed the administration structures in Poland by the re-introduction of counties (powiaty), creating a third administration level. With this reform competencies and responsibilities of the lower administration levels (counties and communes) definitely have been strengthened.

The re-organisation of the *Ministry of Environmental Protection, Natural Resources, and Forestry* in April 1998 stressed with the combination of environmental policy directly with European integration in the newly created Department of Ecological Policy and European Integration the serious will to achieve the goals necessary for complying with the environmental *acquis communautaire*.

The *Ministry of Economy* is responsible for energy policy issues. It is in charge of implementing the goals formulated in the Energy Policy Strategy until 2010, which will cause great changes in the structure of energy supply and have a strong impact on employment and social issues. The above-mentioned *Energy Regulation Authority* sets prices for energy agents and issues licences for energy related utilities.

The *Committee for Regional Policy and Sustainable Development of the Council of Ministers* and the *Energy Regulatory Authority President's Consultative Council* are bodies, whose task is i.e. the integration of energy and environmental policies.

The *National Fund for Environmental Protection and Water Management*, the *Voivodship's Funds for Environmental Protection and Water Management*, and the *Municipal Funds for Environmental Protection and Water Management* play an important role in financing environmental investments and projects through their revenues from environmental charges and non-compliance fines.

5.5.4.2 Policy Formulation and Implementation

The following strategies and programmes are the basis for present and future environmental policy performance: the *Energy Policy Strategy for Poland until 2010* from 1995 formulates the need to promote combined heat and power production and as well the use of renewable energy sources, whose share totals at the time at 1.5% of total energy supply and is intended to be increased to 6% by 2010.

The *National Social and Economic Strategy* from 1995 outlines the directions of social and economic development of the country, considering the principle of sustainable development as an integral element.

The *National Strategy for Integration into EU* from 1997 formulates in its ecological part the adjustment activity programme aimed at transfer of the environmental *acquis communautaire* into Polish legislation and its implementation and execution.

The *Strategy for Sustainable Development of Poland until the Year 2025* was adopted by the Sejm in March 1999 and is to be presented to the Parliament by the Council of Ministers by the end of June 2000.

In preparation are the *National Strategy on Environmental Education* and the *Country Strategy on Biodiversity.*

In order to execute these strategies several programmes focussing on particular environmental issues like reduction of emissions of sulphur dioxide, increasing forest cover, cleaner production etc. has been elaborated. The *National Programme of Preparation for Membership in the European Union* from 1998 is directed at transforming the priorities recorded in the Accession Partnership, proposed by the European Commission in its screening reports as tasks of significant importance for integration. A national climate programme is currently under preparation.

5.5.4.3 Policy Instrumentation

Policy instrumentation in the field of environmental protection in Poland consists of a combination of instruments: it contains in particular regulatory and economic instruments including economic incentives, while voluntary agreements do not exist yet but are to be introduced in the next years.

Polish legislation on air protection and monitoring the requirements is included in the *Act on Protection and Management of the Environment* (1994) presently being revised in order to comply with EU environmental legislation, and in the *Act on State Inspectorate for Environmental Protection* (1991). The *Act on Energy Economy* (1997) regulates all issues dealing with energy supply and consumption as well as with concession and price policy.

Economic incentives and taxes also have a regulatory effect on energy consumption and behaviour towards environmental issues. Fees and fines levied on extraction, transportation, and end use of energy have been existing in Poland since 1970, but did not show much effect before the political change in 1989, because in an economy without market conditions plant managers had little incentive to pay attention to price stimuli. In the last ten years fees for pollution of the environment have been changed several times, some of them like the charges on sulphur dioxide and nitrogen oxide emissions are among the highest in the world (both 0.30 PLZ/kg), compared to very low charges on carbon dioxide and methane (both 0.00015 PLZ/kg). Currently the introduction of a surcharge on energy agents and fuels is being considered which would be applicable to all mining energy agents and fuels (coal, gasoline, oil, and gas).

The Polish charge system, addressing the User Pays and Polluter Pays Principles, has generally become regarded in the region as a model for successfully implementing economic instruments for raising earmarked investment funds. The current system of economic instruments is applied to air emissions, water extraction, waste water discharge, solid waste disposal, and cutting trees and bushes. The revenues from charges and non-compliance fees are distributed among the environmental funds.

Taxation and tax allowances play a rather minor role in encouraging environmental investments, recycling, and consumption of „green goods“. The Polish tax system provides a zero percent VAT rate for a number of products and services related to environmental protection.

Currently in discussion is the introduction of a tax on carbon dioxide.

Tax allowances and exemptions concern e.g. investments in environmental protection and modernising of farming equipment, renewable energy sources, water supply and sewage collection installations, etc.

Incentives like eco-labelling and eco-auditing are being practised and compatible to EU law. Presently taken into consideration by Polish environmental officials are the introduction of product charges and tradable permits.

Policy instrumentation still seems to be focussed on legal and economic regulations in order to implement environmental protection targets. Despite the incomplete enforcement of environmental fees and fines, the financial assets, which they generate, permit the efficient operations of funds for environmental protection and water management, which have become the driving force for investments in this area. Currently there is definitely a growing intention to be seen to use more flexible instruments like soft loan credits, preferential credits, and grants. Also incentive instruments like modifying pricing systems, simplifying the charge systems, introducing specific product charges and deposit systems will be increased in the future. To date there are no incentives promoting renewable energy sources, but policy will have to react on the resolution of parliament from July 1999 demanding the increase of renewables at 6% of total energy supply by 2010. Integrated resource planning as formulated in the energy law from 1997, promoting energy efficiency and encouraging voluntary self-commitments, will be of great importance for future policy instrumentation.

5.5.4.4 Environmental Expenditure

Public and private expenditure in the field of environmental protection amounted in 1997 to 8.1%, on water management on 2.0% of the national economy. The major environmental investment is granted by the rapid increase of revenue from pollution fees and non-compliance fines which have been earmarked for environmental investment via local, regional, and national environmental funds.

Domestic sources of environmental finance provide the greatest amount of investments in this sector, the share of enterprises being 27%, followed by the National Environmental Fund with 26%, Voivodship Environmental Funds 20%, municipal budgets 12%, Municipal Environmental Funds 6%, and state budget 5%. International aid amounts only to 4% of the total, financing in general rather medium-term environmental policy goals in the area of cleaner production, energy conservation, air protection, environmental monitoring, training, and environmental education.

Activities implemented jointly according to the Kyoto Protocol from 1997 are presently being started. To date Poland has signed a joint implementation agreement with the Netherlands, others being expected to follow soon.

5.5.4.5 Policy Style

According to the national programmes and strategy guidelines for preparation of membership in the EU, a co-operative policy style is explicitly intended in Polish environmental policy. Despite of the formulated intentions to co-operate with different stakeholders like research institutions, business representatives, local authorities, and environmental NGOs, there seems to prevail, at least on the state level, still a more command and control-type of policy style. In contrary, a *dialogue and consensus oriented approach* is presently rather rare but is practised in single cases, so. e.g. in consultations of nature conservation authorities with inhabitants and NGOs in the Bia-

lowieza region, concerning national park issues of the „Green Lungs of Poland“, or in talks of government officials with business managers of some enterprises. Although an increasing number of documents are being consulted, there are still no systematic and clear procedures for consultation on issues of proposed legislation, governmental programmes, and plans.

Conflicts between energy policy and environmental and nature protection do not seem to play a dominant role yet, the energy sector still being characterised by a „hard coal mono-culture“ receiving further investments and subsidies, and coal miners and their trade unions being of great influence. As implementation of short and medium term goals has been mainly focussing on improvement of existing coal-based infrastructure introducing best available technology, policy has shown to be rather non-conflict oriented in this area, which certainly is also due to the expected negative social impacts like high unemployment rates in some regions of the country.

In the area of nature conservation the policy style is evidently decisive, pro-active, and ambitious, whereas in the energy sector it seems to be rather re-active insofar as there is more confidence in technological innovations and end-of-pipe solutions than in an integrated policy strategy.

5.5.4.6 Actor Configurations

Due to the spatial reform enforced since the beginning of 1999 and re-introducing counties as a third administration level, *intra-sectoral co-operation* will have to be established newly or re-established, and the actors concerned have to build new or extended networks. Competencies and responsibilities of the lower administration levels have definitely been strengthened by the reform, which might promote the subsidiarity principle. With the efforts to achieve membership in the EU in the shortest possible time, intra-sectoral co-operation and networking on the different levels like the EU, national, regional, and local are increasing. However, it is already obvious, that especially at voivodship level an increasing number of inter-regional contacts and co-operation also in regard to environmental issues like e.g. water management in the Odra River basin are existing. Another already well-functioning example is the Polish „Energy Cities“ network, which gathers by now 30 municipalities and is being extended further.

Inter-sectoral co-operation is in Poland's EU accession strategy explicitly demanded from all the bodies concerned. Ministries, ecological funds, environmental protection inspectorates, national parks and state forests, are held to create cross-section information systems and to popularise the data about environment.

Integration of environmental issues in other sector policies is to date in most cases insufficient, so e.g. in the field of energy which is highly influential on the state of environment but is still strongly dominated by coal use for energy supply. This might improve with the implementation of the *Energy Policy Strategy for Poland until 2010* from 1995

which will promote combined heat and power production as well as renewable energy sources, and also enhance natural gas use and energy efficiency efforts.

The transportation policy shows to date an insufficient integration of environmental issues because it still seems to support mass motorization instead of supporting public transportation and combined transportation. But with the recent meeting „Transport and Environment“ of officials of the Ministries of Environment and Transport, representatives of Sejm and Senate, as well as NGO members, first intersectoral contacts seem to have been established.

Integration of environmental protection goals into different policy areas like transport, industry, agriculture will definitely be improved by the work of the newly established Committee for Regional Policy and Sustainable Development of the Council of Ministers.

Participation of domestic ministerial and non-ministerial research and development institutions and consultations with the industry in particular sectors are in parts already realised. Discussions including social partners like trade unions, local self-governments, non-governmental organisations, on selection of optimal activity variants are eventually practised. In general, inter-sectoral consultations currently seem to increase, but it is obvious, that further capacity building on various stages and in different groups of society will be of crucial importance for future work.

Co-operation of regulators and regulated is currently increasing, as the influence of NGOs on decision-makers is gradually growing with their institutional capacity being improved, but a generally functioning network is still lacking.

Co-operation among the regulated is still sporadic, but might be enhanced in the future e.g. by the newly founded Environmental Lobbying Support Office in Warsaw.

5.5.4.7 Conclusions

Poland stands out as the most successful of the countries in Central Eastern Europe in terms of environmental policy. There is a real de-linkage between economic growth and some of the air pollution parameters like sulphur dioxide and particulate, while parameters like carbon dioxide, nitrogen oxide, and nitrogen dioxide still are increasing, due to an energy policy relying mainly on coal reserves for energy supply, and also to a transport policy leading to expansion of road traffic.

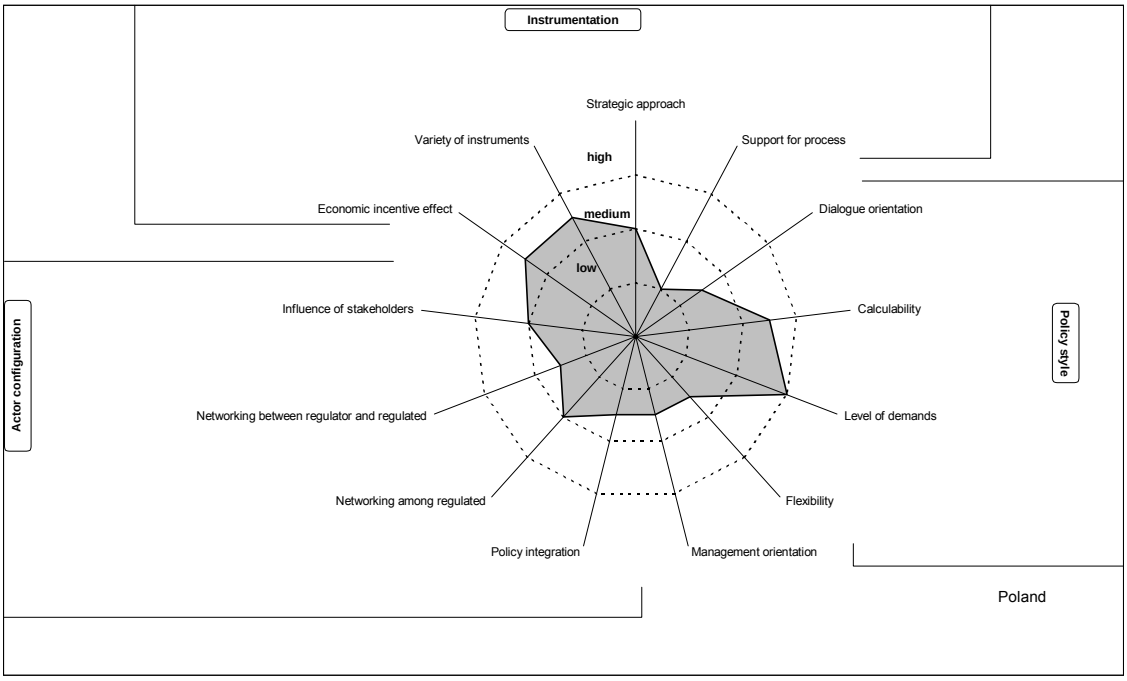
Capacity building activities directed at non-governmental groups and staff of small enterprises in order to encourage small scale projects on energy efficiency and energy saving as well as environmental awareness raising are needed and will be highly appreciated.

In particular, well-functioning networks of strategic actors from social groups and responsible managers and employers representing small and middle firms, both belonging to the stakeholders who are among the driving forces for innovation and modernisation

in the field of environmental protection, will be of crucial importance in the political arena in Poland.

Also networks of small and middle enterprises active in the environmental protection sector like the German organisation B.A.U.M. (Bundesarbeitskreis umweltbewusstes Management), which takes an active part in the campaign „Solar - na klar“ promoting solar energy, could certainly be helpful for sustainable progress in Poland.

Figure 17: Regulation Pattern of Poland



5.5.5 Slovenia

5.5.5.1 Institutional Framework and Policy Arenas

In 1991, the *electricity sector* was reorganised to a decentralised structure with separate production, transmission and distribution entities.[13] However, the power sector remained under direct supervision of the Ministry of Energy (now the Ministry of Economic Affairs MEA). The state is the owner of almost all assets in the electric power sector, except a small share of the distribution companies owned by employees. The attempts of the electricity industry to create a single-head, unified representation of the

[13] This summary is based on the respective country-study, which has been elaborated by Prof. Dr. Miha Tomšič, “Jozef Stefan” Institute, Energy Efficiency Centre, and Andrej Klemenc, Slovenian Energy Forum, Ljubliana.

interests of the electricity sub-sector by creating a national electricity holding company failed. Especially the *distribution companies* preferred to enjoy relative autonomy and follow their business interests. The new organisational structure and a ban on sales of domestic coal to individual consumers has, however, enforced the ties between coal mining industry and electricity generation companies.

The electricity sector has not been fully commercialised yet, remaining under the complex and rigid administrative regime, which served at very first political-administrative goals of monetary (anti-inflation) and regional employment policy. Policy-making is not only influenced by different ministries (Ministry of Economic Affairs, Ministry of Economic Relations and Development, Ministry of Environment and Physical Planning, the Ministry of Finance) and the complexity of their mutual adjustment, but also by bargaining of the political parties and respective interest groups. Nevertheless, the process of restructuring and commercialisation of the electricity industry has progressively gained momentum.

The emergence of an *energy efficiency policy arena* can be characterised as the most important change within the energy policy community during the nineties. Although activities related to energy efficiency have a longer tradition, the first governmental strategy and related measures have been launched as in the beginning of 1990s. The former *Ministry of Energy* supported the foundation of the private *Agency of Energy Restructuring* (APE), which has worked out the first institutional supports programs in the field of energy efficiency (EE) and renewable energy sources (RES).

Since 1995, the central role in the field of EE has been taken over by *Agency of Energy Efficiency* (AURE), who is also the main co-ordinator of respective programmes and activities with the EU. A set of consultant companies in the field emerged since 1992. The *Centre of Energy Efficiency of Institute Jozef Stefan* (IJS-CEU) first focused on an assessment of EE potentials in the country and EE technologies and approaches in industry. However, together with domestic and foreign partners, it has carried out some general studies on efficient energy planning and policy at the national level. Recently, it is also involved in support of EE policy of municipalities.

The *Civil Engineering Institute* beginning of 1990s started to set up the national network of energy advisers EN-SVET in co-operation with Austrian partners and is carrying out main consulting as well as pilot and demonstration projects in the field of EE in the building sector. Both institutions in question are members of the OPET network and are show increasing interest in the field of RES. Nevertheless, a dozen of private consultant and engineering companies started to deal with municipal energy planning and consulting activities for industry and the public sector since 1994. Since the majority of the industries is privatised and faced with competition, the market for EE in companies is growing. This will also include electricity (co-generation), due to the favourable provisions of the new Energy Law. In parallel to the increased sensitivity of industry for reducing (energy) costs and improving (energy) services, there are substantial capacities in consulting, engineering and international networking in this area, as well as a well tuned

and undisputed central state agency. Less promising is the situation in the *public sector* and in *households,* where an adequate pattern of addressing and involving of the target groups, a corresponding institutional framework, financial engineering knowledge and practical experience are lacking.

Contrary to the EE arena, the arena in the field of renewable energy sources still lacks a core state institution. While the provisions of the new Energy Law suggest, that *AURE* will be also in-charge of supporting renewable energy, the Agency of Energy Restructuring (APE), which since 1993 has a status of para-state agency, has the largest experience, capacities and references in this area.. However, this status is now being challenged not only by AURE, but also by some private consulting and engineering companies, which have specialised into wood biomass based DH projects and/or municipal energy concepts/planning.

The role of *municipalities* is important both for energy efficiency and especially renewable energy policies. However, the municipalities lack tradition and capacities to deal with (renewable) energy and in most cases even political will. Despite the endeavours of consulting companies, engineering companies and NGOs in this field, neither energy efficiency nor renewable energy are considered an issue by most municipalities, with few exceptions. One reason for this is, that REN and EE are not elements of environmental protection and regional development policies of the state. This and the fact, that there are not any perceptible and centralised state functions, yet, might be the most important reason why the co-operation within EU programmes and EU involvement in general have been far below the potential of the country in the field so far.

The favourable purchase (feed-in) tariffs for electricity from small-hydro power plants which are the result of a respective "gentlemen agreement" between the *MEA* and the owners and operators of such micro-plants, have led to increasing conflicts between the *MoE* and small hydro producers due to the weak environmental protection monitoring and enforcement capacities of the state. This might also explain the conservative approach of the MoE in relation to renewable energy in general. Recently, the national *Environmental Development Fund* started to offer soft loans to modern wood to heat conversion technologies within its *fuel-switching programme*. However, despite a parallel subsidy scheme for RES issued by the MEA, these combined measures are not sufficient to stimulate a snowball dynamic in the field of renewable fuels.

5.5.5.2 Policy Instrumentation

Most important conceptual and institutional innovations were introduced by the *Law on Environment* and the *Law on Public Trading Services*, both designed at the beginning of nineties. The Law on Public Trading Services (1993) has brought the concept and legal arrangement of concessions. The *Environmental Protection Act* (1993) provided the legal basis for the introduction of *economic instruments* such as pollution charges, fees and taxes and the establishment of the national *Environmental Development Fund* (EnDF). Besides this, the law set up a legal framework for so called "environmental

reservations" in the privatisation process, i.e. for the capital stocks, which must be reserved and earmarked for an improvement of environmental performances of the company and/or sanitation of environmental damages within the process of privatisation.

Since 1995, the EnDF issues soft loans for fuel switching to environmental friendly fuels for industry and for households, as well as for environmental improvements related to the municipal infrastructure (e.g. district- heating). The *fuel-switching programme* is one of the most important instruments supporting the penetration of natural - and to a less extent also for liquefied – gas. However, it is not sufficient as a support instrument for renewable energy.

In 1997, the MoE introduced a *CO_2 tax*, which was fine-tuned and substantially increased one year later from a level of 5.5 Euro/t CO_2 to 16.1 Euro/t CO_2. The tax currently contributes approximately to 2 % of state budget revenues. It has, however, the character of general budget revenue and it is not earmarked for EE, RES and climate protection measures. Another drawback is, that the tax is not part of a systematic GHG reduction strategy and concept, but rather an isolated measure. The tax burden is effectively reduced due to various exemptions and allowances. The MoE has also issued/renewed a set of emission standards for SO_2, NO_x, dust and particles for large combustion plants, heating plants and industrial combustion plants, however, not for small boilers and heating devices.

In 1991, the Ministry of Energy issued for the first time soft loans for EE and RES, as well as grants for energy efficiency promotion and demonstration activities carried out by private companies or NGOs. After 1992, the loans for EE and RES were changed into the grants and subsides for project preparation, pilot and demonstration activities issued annually by public tender organised by the MEA. Since 1994, the MoE is co-financing the network of energy advisors for households. Since 1995, this programme, together with the programme for promotion of EE and RES, is operated by AURE. Since 1996, this agency is co-financing energy audits in industry and the public sector, as well as municipal energy concepts. In late 1998, the *Energy Efficiency Fund* was established. It is designed as a revolving fund aiming to offer soft loans at very first for EE in industry. EE labelling is currently under preparation.

The recently adopted *Energy Law*, which transposes major requirements of the EU Electricity Directive, includes the criterion of sustainable development. Integrated resource planning has been identified as the approach to be used for elaborating the National Energy Programme. Local governments are expected to prepare municipal energy concepts. The introduction for "green electricity" certification and quota for resellers is settled likewise. The law includes provisions on privatisation of generation and distribution companies.

Generally speaking, a broad set of new, mostly soft instruments was set up during the 1990s. However, to assess policy instrumentation, i.e. the "orchestration" of policy instruments for different target groups is a rather difficult task and remains an open issue. Certain support instruments (like counselling, information, education and awareness

raising campaign) are financially weak, lack regularity and continuity. From 1992 until recently, energy policies were subject to monetary and social policies focusing on keeping inflation low while maintaining employment in traditional industries. The *strategic orientation* of policy instruments must be considered as comparatively low. Only in the last stage of the parliamentary process have air and climate protection been included into the recently adopted National Environmental Action Plan. These issues, however, are not stressed in the same manner as water protection, waste management and others.

5.5.5.3 Policy Style

The Slovenian country-study convincingly demonstrates different policy styles being characteristic of the main actors, the MEA and MoE, which however, were subject to changes during the transition period.

The *traditional* (socialist) type of policy-making was predominantly based on the production of expert legitimisation of the decisions made within an internal circle of the dominant domestic supply side actors (energy industry, expert institutions, suppliers of technology and equipment, engineering, civil and financial engineering companies). Not the expert legitimisation as such, but its form of single-discipline approach based "objective truth" neither explaining presumptions nor dealing with options risks and uncertainties, was publicly questioned since the early 1980s, However it remained inevitable part of all decision-making process on large investment in energy sector within the 1990s.

After a short period of pro-active, open and innovative energy policy-making between 1990 and 1992, a restoration of traditional policy styles in the electricity, mining and nuclear sub-sectors could be observed. The main characteristics of policy-making were sectoral status quo politics, non-transparency of policy formulation and participation, clientelist policies, exclusive participation limited to the interests of the electricity supply sector and lack of conceptual baselines. Expert knowledge has not been used as a tool of seeking consensus between different paradigms or to improve learning capacities, but as an instrument to legitimise secret decisions made before the formal policy process started. During the 1990s, non-decision-making became a "modus operandi" of energy policy. Up to 1998, the MEA has focused on energy policy as a matter of constructing new energy supply capacities which correspond to narrow sector defined criteria of national interest: security of supply and use of domestic resources.

Only recently, a *marked change* in the pro-activeness of energy policy-making and in the policy style in general emerged. This change has been provoked by two factors: a reproach of the EU Commission, which criticised the slow pace of structural reforms in the energy sector on the one hand, and personal changes in key positions within the MEA on the other hand. The initial drafting process of the new energy law, however, clearly showed, that the protection of domestic energy producers from market opening has been still the leading rationale of the ministry. Actors, who were not representing

the interests of national monopolies, were not consulted during the initial drafting procedure and did not have any direct access to information, either.

Only after important personal changes on the top administrative level, the mode of policy-making substantially changed in favour of a pro-active, transparent, and consensus-seeking policy style, based on clear policy guidelines and a transparent agenda and procedures. Not maximum protection of the domestic energy industry, but rather the competitiveness of Slovenian industry and decreasing energy costs gained top priority in the policy agenda. This resulted in a consecutive re-drafting of the Energy Law in favour of more competition and market opening. The process of re-drafting has been described as an open process favouring the interaction of all stakeholders including those with marginal or not yet aggregated interests. This type of interaction was more consultative than formal. It is difficult, however, to judge about the stability of this comparatively innovative, consensual, dialogue and knowledge oriented policy style.

The policy style of the *Ministry of Environmental and Physical Planning* (MoE) has been characterised as expert-based, formalistic, inclusive, and oriented towards the employment of new policy instruments and tools. The ministry seems to be open to new actors and approaches in ad hoc and single issued arenas, whereas in arenas of strategic policy it is tending to give time and/or procedural advantages to the actors with already aggregated interests. The policy style of the MoE within the process of drafting the NEAP has been criticised as slow, pragmatic, lacking transparency and enabling only formal participation.

The *Environmental Protection Council* of the National Assembly and GLOBE Slovenia, which is a trans-party network of MPs devoted to the environment and open to the civil society, play an important role as interest mediation and participation institutions.

5.5.5.4 Actor Configurations

Lack of transparent structure and clear divisions of roles and competencies, as well as procedures has been characteristic for energy policy arena in nineties. While traditional strong supply side actors have influenced agenda-setting and maintained their direct access to the Ministry of Economic Affairs (MEA) and other policy makers, they have been less successful in adjusting their collective action to a new, decentralised structure of energy policy-making within the government. In particular, they are not able not adjust their collective identity and patterns of interest aggregation to the situation in which - due to the structural changes of the economy and politics - long term oriented, simple positive sum game of constantly increasing supply side capacities as a result of collective pressure and solidarity of the coalition of growth has lost its logic.

On the other side, the new proponents of demand-side approaches and renewable energy deal likewise with the problems of collective identity and aggregation of interest. Lack of economic knowledge and communicative skills, as well as an imaginary of the global institutional set up (like green budget reform, for example) which would open the per-

spective of positive sum game for energy servicing companies, are the barriers which are not enabling those actors to act politically. The new actors in the field of EE and REN directly or in-directly try to influence the decisions in the energy policy arena, their action being predominately privatistic, i.e. aimed to get support from one or the other state policy managers or gatekeepers for their individual interests.

Only the NGOs endowed with expert knowledge in energy matters, a mixture of professional, environmental think thanks and citizen's non- profit organisations publicly claimed for new and more transparent procedures in favour of public participation. After the green parties lost significance in party politics, the energy issues would have otherwise been generally absent from party-political and public agenda. Contrary to the 1980s, in the 1990s energy policy matters lost their general importance for the media and political actors.

Although the Ministry of Environment announced a new, more active role in energy policy, particularly when developing the Environmental Protection Act (1993) and the Environmental Development Fund (1994), its function remained limited to the traditional role of the (environmental) gatekeeper in the arena, even despite of its active role in designing the CO_2 tax. The potentials of policy instrumentation given by the Environmental Protection Act have been used, however, this has not influenced the role and policy style of the ministry.

The role of the Ministry of Finance (MoF) has remained limited to gate-keeping with special impact on using command-and-control tools for keeping the inflation down. Because of the clear positive impact on budget revenues, the MoF has been flexible in approving the CO_2 tax. Regarding the barriers for third party financing of energy efficiency projects in the public sector, the ministry has not found capacities to put this issue on the agenda yet. The passive, gate-keeping attitude is also characteristic for the *Ministry of Economic Relations and Development* (MERD), where a supportive role in the energy field can be found only to the construction of large hydro power plants, which shares also the support of the political party SLS.

The *Ministry of Economic Affairs* (MEA), being in charge of the energy sector, has played the role both of a promoter and of a process manager/director in most decision-making processes related to energy policy documents and larger state supported investments. However, it played its role of a promoter usually on behalf of certain electricity generating and/or coal-mining companies. Thus, also its capacities of a policy manager within the policy process at the governmental level have been weakened. Within the process of formulating the new Energy Law, the (MEA) has clearly signalled not to be willing any more to play the role of promoter and policy manager of single options and to give priority to the management of legislative process and to the procedural rationality.

Due to its capacities of expert knowledge and well- established networks with policy makers, politicians and media, the national electricity company ELES can be regarded the most important single domestic non-administrative actor in the energy policy arena.

In the period of 1990-1992 when a representative of the Green Party was Minister of Energy, substantial efforts towards an *integration* of environmental considerations into energy policy were made. This included innovative procedural and institutional approaches, e.g. the co-operation programme with NGOs, or the establishment of the *Energy Advisory Council* as a consultative body, or the establishment of APE. The energy policy was oriented towards consequent energy price adjustments and towards removing state subsidies for coal mining. Besides, the ministry supported actively energy efficiency, a strategic field of policy integration.

An important institution for policy integration is the *Environmental Development Fund* (EDF), which has a fuel switch programme. A promising institutional approach is the *Slovene Committee for Climate Change Issues*, which has been established in 1997 and which includes top-level representatives from different ministries, as well as from industry, the science community and NGOs. We lack information on the real performance of this organisation. Systematic policy integration, however, is lacking. Intra-and cross-sector policy integration is further weakened due to the comparatively *fragmented* decision-making structure and dispersion of responsibilities.

There are several interest representing and professional associations, such as the *Association of Owners and Operators of Small Hydro Plants*, the *Slovene Solar Association*, the *Slovene Bio-mass Association*, and the *Association of DH and Cooling*. There can be found several positive examples of networking initiatives among the different stakeholders and between regulating authorities and regulated stakeholders. We mentioned already the innovative, nation-wide energy advisory network for households *ENSVET*. The association of the owners and operators of small-scale hydro power plants, COGEN Slovenia and energy efficiency based Energy Forum are organised and connected to GLOBE Slovenia in order to improve the conditions for independent power producers.

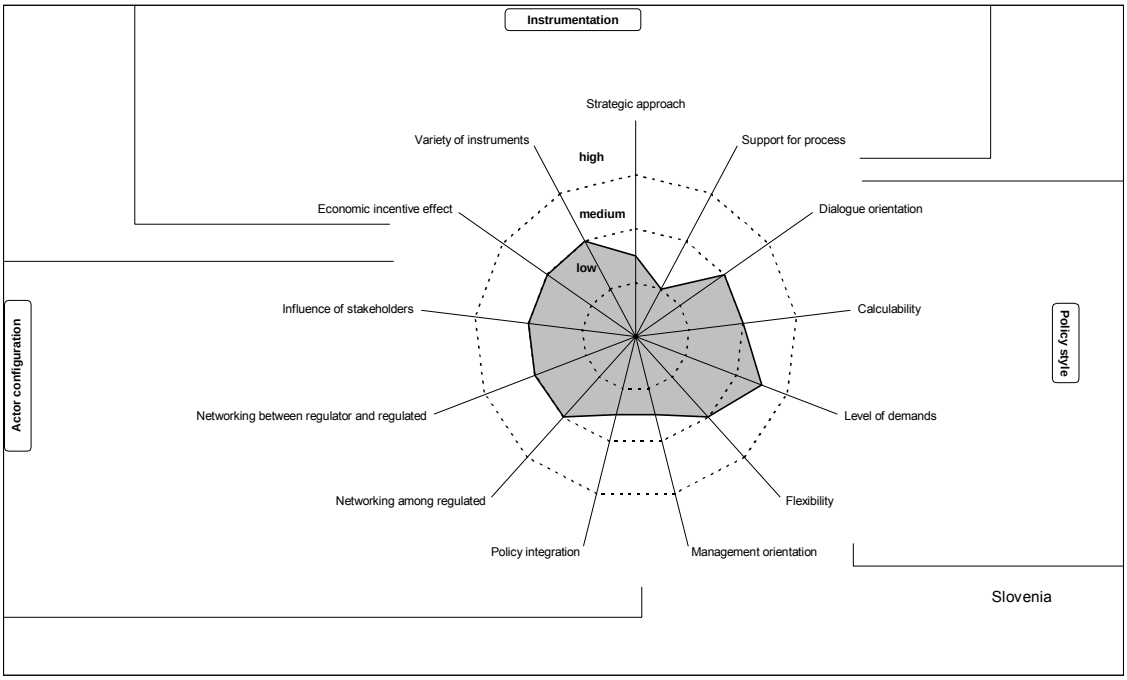
AURE, as well as IJS CEU perform very important networking and co-ordination functions as focal or crystallisation points in the sphere of energy efficiency disposing of well established contacts to the relevant professional communities and with excellent access to policy-makers. The *Chamber of Industry* remained a vehicle of aggregating supply-side interests and to a less extent serves as an intermediary body for industrial auto-producers. The traditional energy supply companies have not yet entered into the EE and REN networks.

5.5.5.5 Conclusions

The institutional structure in the field of energy efficiency seems to be comparatively fragmented. The responsibilities and competencies in this area are dispersed among various actors. In particular, there seems to be a lack of clear institutional responsibilities for the support of REN. There is also a lack of continuous support and training for *municipalities* in the field of EE and REN. According to the new Energy Law, local governments are expected to prepare *municipal energy concepts*. Systematic training of

local decision-makers should actively support the implementation of this important target. Instrumentation might be further diversified. Particularly, existing legal and other barriers for *third party financing* and energy service companies should be removed. Despite some promising networking and coalition-building approaches, there is a general weakness of relevant stakeholders to create lobbying capacities and establish stable actor coalitions.

Figure 18: Regulation Pattern of Slovenia



5.6 Synopsis and Conclusions

One of the objectives of the policy analysis was to explore country-specific regulation patterns in the five applicant countries. The rationale has been to analyse the performance of environmental policy in the energy sector and to assess to what extent the policy framework in each country bears elements, which facilitate environmental innovations. By no means is the intention to curtail the importance of the economic performance of a country as a leading, perhaps the most influential explanatory variable. The intention is rather to focus on the environmental policy-making system itself and to identify strengths and weaknesses of the policy framework.

Even if the methodology applied might be improved in terms of quantitative research, the qualitative comparison of country-specific policy frameworks leads to following conclusions:

The synopsis reveals common characteristics in the field of policy styles. Major weaknesses in all countries are for instance, a rather low level of dialogue and consensus orientation or a predominance of command-and-control in decision-making. Regarding the actor configurations in the field of environment and energy, the analysis illustrates that both intra- and cross-sectoral policy integration are rather poor and not effectively practised.

Further shortcomings are underdeveloped networking activities, both among regulated stakeholders and between regulators and regulated stakeholders. Several countries have established already functioning and innovative networks of energy efficiency institutions on the central and regional/local state level. These networks, however, require stabilisation and extension.

There are clear differences between the countries in terms of policy instrumentation. Several countries, such as Poland and to a lesser extent the Czech Republic and Slovenia, have endorsed a relatively diversified policy mix. The strategic orientation of the policy tools, however, is mostly lacking. Innovative strategic concepts, such as National Environmental Action Plans, have been adopted in most countries only recently. It is too early, yet, to judge their effectiveness and performance. Only in Poland, the incentive effect of economic instruments is on a high level. The Polish pollution charge system has generally become regarded as a model in the region for successfully implementing economic instruments for raising earmarked investment funds.

In order to overcome the specific difficulties of the applicant countries on their way to EU membership, we strongly recommend to support and strengthen their efforts by effective capacity building. The possibilities to influence policy styles in a country are very limited, because these are subject to changes only in the long-term.

An area, which offers favourable conditions for assistance and which is of strategic importance to the applicant countries, is to our opinion, the transformation of actor constellations by *developing capacities through networking*. This refers to networking activities between state actors and affected interest groups, as well as networking in the informal sector encompassing pro-active members of civil society, including scientists and engineers from the techno-economic community. Particularly, the municipal level has been fairly neglected so far. The already existing initiatives (e.g. in Slovenia, Poland, and the Czech Republic) and coalitions might serve as multiplicators for creating stable innovation networks.

In addition, we suggest to build up and extend the cognitive-informational capabilities by enforcing networking and co-operation in the field of education and awareness-raising. Support to grass-root initiatives concerned with energy saving and renewable energy sources, which might disseminate individual experience regionally or even country-wide, could initiate innovative networks.

By favouring the networking approach, we plead to develop the capacities for capacity-building.

6 Existing Co-operation

Further co-operation in the field of environment and energy between European and the Accession Countries might facilitate the accession process for the latter ones. But before intensifying co-operation it might be helpful to assess the experiences made in ongoing or co-operation projects that are finished already. The main objective of this section is to evaluate exiting bilateral and multilateral co-operation in the field of environment and energy and to draw conclusion for future co-operation projects from this analysis.

The approach to this task encompasses the following four steps:

- screening of existing co-operations projects;
- selection of the most important projects according to the criteria given below;
- detailed description and evaluation of selected best practice projects;
- elaboration of common patterns and general conclusions for future co-operation projects.

Steps one to three were carried out by the co-operation partners in the Accession Countries as they had access to project and programme information which mostly was available in the domestic language only. Step four of this approach is given below.

Aim of the screening of bilateral and multilateral co-operation project was to get an appropriate basement for the selection of best practice projects. The best practice projects that have been evaluated in details were selected according the following criteria:

- Broad impact: the project should have a substantial impact either with regard to the national environment or with regard to national developments initiated through the strictly speaking small project.
- Replicability: the project should be not unique but replicable on a national or international level (e.g. application in other Accession Countries).
- Innovative: the project should be innovative in that sense, that it has never been seen before or that the way it was carried out is new and different to former projects.
- Building internal capacities: the project should reduce dependence from foreign aid and contribute to the generation of domestic capacities in the field of environment and energy.

The co-operation projects selected according to these criteria by each domestic partner as national best practice projects are stated below. After the short description of these projects[14] common patterns and conclusions for future co-operation projects are given.

[14] The individual contributions of each co-operation partner (screening tables, selection of best practice projects, project description and evaluation) are documented in the country profiles.

6.1 Czech Republic

6.1.1 PHARE

In March 1997, an Energy Saving Fund was launched with PHARE funds to support SME which introduce energy efficient technology, thus aiming to stimulate business opportunities in the energy saving sector which will decrease energy consumption in the long-term. Soft loans are available for bankable energy efficiency projects - debt service is expected to be repaid from cost savings.

The fund is revolving. The initial instalments have been disbursed. Repayments of awarded credits are re-capitalised and allow further financing (sufficient only for several projects a year). The scheme proved to be successful, no further instalments are expected, though. The scheme has been useful for all actors to learn about energy efficiency projects development, financing and benefits. With current interest rates the bank might finance some EE projects commercially.

6.1.2 Programme/Fund MUFIS (Financing of Municipal Infrastructure)

A Daughter Bank of the Czech-Moravian Guarantee & Development Bank manages the MUFIS fund. The fund represents a kind of loan amounting USD 100 million within 1994 - 1998 from private US financial sources with state guarantee from the US and Czech governments. Loans with long term pay back period can be given from the fund to municipalities through commercial banks under beneficial conditions for municipal infrastructure development. Loans amounting CZK 3 up to 100 million can be given to municipalities or municipal utilities with interest rate 12 % and pay back period within 7 up to 15 years in case supply of households represents more than 50 % of the project costs.

6.1.3 Energy Efficiency Centres

Since the beginning of nineties several energy efficiency centres have been established in the Czech Republic. These centres (e.g. SEVEn) were established on the base of concrete project to perform, with the time-limited financial support. The national experts are enabled through these pilot projects get familiar with the aspects of performing energy projects the an effective way. Foreign supporters do not manage the energy efficiency centres, the centres are only advised how to perform project, how to obtain information, how to manage the business connected with energy efficiency enterprise etc.

The time-limited financial support and approach based on independence in decision making in the contrast with the plat subsidy and direct foreign management appeared the main reason of success many of these centres. The main goal of established national centre in the initial is to obtain experiences from the pilot project to continue and manage the energy efficiency activity after the time-limited financial support expires.

6.1.4 Project Development

As the experiences with energy efficiency projects in the Czech Republic grows, it seems to be very beneficial to share these experiences. There is still lack of awareness and information that help to develop energy projects the way. Awareness has been raised through inter-active workshops for municipalities, which were aimed on the competent authorities in town, to provide them information about energy project development, financial background and help them to identify appropriate financial sources.

Other tools that helps to enhance the interest of energy projects are financial manuals that help to manage energy projects. Very useful seems to provide information of available financial sources in the lists with explanation of accessibility conditions of these sources. The explanation of the principles of the energy efficiency implementing help to create environment where competent authorities and energy entrepreneurs are informed and able to utilise know-how and information for energy efficiency project implementation both in governmental and private sector.

6.2 Estonia

6.2.1 Procurement of Ambient Air Quality Monitoring Equipment

The air quality in Estonia is not uniform. There is a big difference between the air pollution level in the North East of Estonia where the big thermal power stations run on oil shale are situated and in the rest of the country. About three quarters of air pollution in Estonia has its origin in the North East. Thus, it is important to have good automatic devices for air monitoring to decide about the real environmental situation in the problematic regions in Estonia. But, most of the monitors in use at the present are more than 16 years old and in bad condition. The data collection system used is ineffective and does not allow the automatic generation of reports in required EU formats. Therefore there exists an urgent need for investment to keep the existing air quality monitoring system in operation, to increase the number of sites monitored and to extend the list of measured pollutants to comply with the EU directives.

The main aim of the project within the PHARE donor programme is the provision and delivery of the equipment, material and software for monitoring the ambient air quality in Estonia together with arranging the operational training. Due to that project it is possible:

- To obtain and set up an independently operated complete integrated set of equipment, accessories, hardware and software to provide air quality data associated with meteorological data in acceptable form and quality for Estonia.
- To be able to generate suitable public reports about the results of air quality measurements, especially in case of exceeding the limit values and thresholds.

- To be able to send the information on monitoring results in the required format to the relevant European Unions structures responsible for data collection.
- To fulfil the requirements of EU Framework Directive on Air Quality according to which the measurement of air quality must be carried out in agglomeration with population higher than 250,000.

6.2.2 Capacity 21 in Estonia

The overall strategy of the project is focused to strengthen Estonia's capacity for entering the 21the century, characterised by a sustainable economic development, solution of social problems and proper use of natural resources. This capacity will be achieved through integration of principles of sustainable development into state, sectional and local strategies and master plans. This improves communication and co-ordination between essential persons and institutions of the development process and promotes broad participation of different social groups for creating the Estonian Agenda 21 as a national development strategy.

The objectives of project that was financed by the United Nations Development Programme are as follows:

- To develop the Estonian Agenda 21 as the Estonian National Long Term Sustainable Human Development Strategy for the 21st century.
- To promote local community planning and Local Agenda 21 development processes.
- To enhance environmental and sustainable human development awareness ensuring that sustainable development principles will be commonly understood through shared analysed knowledge and experiences.

The following outputs were generated through the project:

- Composing, publishing and distributing the second edition of the Local Agenda 21 Guidebook.
- Creating a WEB site in the Internet based on the current Estonian Sustainable Development Database (www.agenda21.ee).
- Establishing an online information distribution through an email discussion forum in the Internet.

6.2.3 National Environmental Action Programme

The methodology of the project is based on the experience of carrying out Central and Eastern Europe Environmental Action Plan (Lucern) and other national environmental action plans in some Central and Eastern Europe states. There was formed 10 ad hoc groups to work out the main trends of the Plan, with involving altogether 264 specialist all over the Estonia. A uniform preference system was applied to all actions evaluated.

The objectives of the project that was financially supported through the PHARE National Programme are as follows:

- To provide a consensus-based list of needed state level environmental actions lined up according to their preference, factoring in the needed financial means and indispensable expenses.
- To be used as a communication tool between the Government and stakeholders, giving a clear pattern of the attached importance to various environmental problems by all major interest groups in Estonia.
- To be used as a guideline for working out various environmental projects.
- To be applied as a co-ordination tool for multiparty environmental projects.
- To enhance the democratic development processes in Estonia for reaching consensus between a broad range of interest groups in Estonia.

On 26th of May 1998, the Government adopted the Estonian Environmental Action Plan.

6.2.4 Establishment of Regional Energy Centres

The main aim of the project was to establish three regular energy centres staffed by local personnel who will train and advise the local municipalities in restructuring of the existing energy systems and in implementing of energy efficiency measures. During the first stage of the project more than 60 local projects have been consulted, financial support was given to 14 projects, local governments have been trained in energy efficiency project management issues.

The project was financed through the PHARE national programme. Its objectives were:

- Reduction of emission levels and improvement of environmental situation through assisting and training local municipalities, companies and consultants in the restructuring process of existing energy systems and in implementing of energy efficiency measures. The regional energy centres should:
- Provide information on energy issues to local institutions and companies.
- Select and train members of municipalities and companies on energy related topics in order to improve their skills on project identification, project description and loan application.
- Assist and collaborate with other institutions to carry out energy related projects in the designated regions. The information should be transferred from the central level to local levels.
- Assist the target group with initial and technical audits.

The main results achieved through the project were:

- Enhanced local capability, especially in less developed regions, to define and prepare feasible projects.
- Facilities have been created for securing a substantially quicker implementation of projects in co-operation with national and international financial institutions.
- A newsletter was introduced and an Internet homepage was opened in order to increase the efficiency of information dissemination.
- Contribution in several projects for Ministry of Economic Affairs (project preselection), Ministry of Finance (feasibility studies for the Public Investment Programme), Ministry of Environment (preparation of National Environmental Action Plan) and also in bilateral projects with Danish Energy Agency, USAID, the World Pank, Nutek and PHARE.
- Organisation of training sessions Energy Planning for municipal key persons, Energy Conservation in Domestic Buildings for home owner associations personnel and Energy Conservation for School Teachers for elementary and secondary school teachers.

Plans for the future are as follows:

- Assistance in preparation of loan secure projects.
- Institutional issues, management and organisation of local energy supply utilities.
- Energy related legislation in Estonia and in the Nordic countries.
- Meter instrument handling and simple energy auditing.

6.2.5 Local and regional energy planning

The idea of this PHARE project was to support investment projects, which are part of an overall energy efficiency improvement programme. The project support included project preparation, an elaboration of local energy plans in order to identify the needed investments, feasibility studies, technical designs etc. Its main objectives were:

- To build up know-how and competency required for effective energy planning in communities.
- To provide assistance to local communities and cities in the energy planning activities.
- To give planned energy efficiency projects rapid and flexible technical assistance, tailored according to the actual needs.

The preliminary results of the Project are as follows:

- During the initial stage of the project, 61 expressions of interest have been received from municipalities wishing to participate in the programme.

- By 1st of January 1999, already 14 projects had been launched and 9 were in the preparation state to be started soon.
- An Energy Planning Manual has been prepared by the project team and reviewed by a focus group, consisting of Estonian experts and representatives from municipalities.

6.3 Hungary

6.3.1 Energy Saving Credit Fund - Energiatakarékossági Hitel Alap (EHA)

The government of the Republic of Germany offered a DEM 50 million aid to Hungary for the sake of purchasing coal in 1991 which was sold to Hungarian citizens. From the 60% of the money generated by this action, a financial source was created simply under the name of German Coal Aid. At the beginning of 1996 the Hungarian Fund for Developing Entrepreneurship became the manager of the program which was renamed as the Energy Saving Credit Fund.

It is a revolving fund that has already been placed out four times. Its favourableness originates from the low interest rate it is lent out at. The interest rate equals to the 50 % of the prevailing basic interest published by the Hungarian National Bank.

It has become an "independent" source for energy saving investments in two striking ways. One of them is the independence from any current and future resource, grant, loan providing institutions: it works according to strictly and clearly set rules, and there is no pressure from any governmental or financial institution.

The other element of EHA's independence is the range of institutions it can supply loans to. Though the most important task of the fund manager is to help small- and medium sized entrepreneurs, the fund aims companies of any kind irrespective to their ownership structure, industry branch, or company size.

As the most stable and autonomous fund in this field, EHA seems to serve energy saving and efficiency investments in a calculable and transparent way, i. e. the program can be followed closely, and companies interested can steadily count on it. EHA has also proved to be flexible due to slight improvements elaborated during the past years.

Multiplicative effects of the program have also been noticed: in a lot of cases, energy saving investments have lead to the increase in the number of employees, to improvement of the export-import saldo, etc.

EHA proved to be successful especially concerning investments targeting the modernisation of public lighting and heating. Renewables will get higher on the fund's agenda in the future.

6.3.2 Energy Efficiency Program - ELÉG

This program serves as a basis for future energy efficiency campaigns initiated by civil organisations. The ELÉG campaign was set going by NGOs and supported by a foreign governmental institution (the Environmental and Energy Agency of the Netherlands, NOVEM). The aims of ELÉG were three-fold:

- Networking: it aimed at building coalition, on the one hand, by trying to establish the basis of partnership between different sectors affected, involved and interested in energy efficiency.
- Awareness raising: the program was designed to raise awareness in energy efficiency throughout the population, on the other hand.
- Capacity building: the program was designed, thirdly, to build capacity within green NGOs for the sake of awareness raising in this field.

The campaign was cheap and efficient. It involved a nation-wide network of participants (green NGOs, schools, electricity and gas distributors, journalists, etc.), that allowed the subsidiarisation of the program and local level decision making. Campaigning was based on several different channels (media, green NGOs). The message, the concept of ELÉG was clear, accessible and simple as required.

Success through coalition building: experts, green NGOs, municipalities, media and departments of the government are already asking for information and even opinions from each other. The capacity building part of the program is the real success. As a result, nowadays, there are 10 green NGOs working closely and co-operating with local partners. They are well-known, acknowledged at local level, and their expertise is widely acknowledged.

Other awareness raising programs have already followed ELÉG; the most recent one is organised and financed by SCORE program.

6.3.3 Energy Saving Credit Program - Energiatakarékossági Hitel Program (EHP)

The preparatory process of EHP dates back to 1994 when the first analysis was made by the Hungarian Energy Office (HEO) about the potential outcome of any energy saving project targeting municipalities. A preferential loan is provided for municipalities, legal entities with economic activity owned by municipalities or companies financing energy related modernisation of public institutions owned by municipalities. The preferential interest means a grant provided by a special fund of the Ministry of Economy aiming economic development. The grant equals 50% of the prevailing basic interest rate set by the National Bank of Hungary.

For a certain investment, municipalities can apply for a preferential loan up to HUF 30 million. Another 10 % of the investment are to be checked by the bank but this money may also come from outside sources such as the EHA. The repayment period is

five years, including a one-year grace period. Investments should be elaborated within 12 months.

EHP is operated by an Interministerial Committee that sets the rules for the prevailing year, decides upon the applications, checks the ongoing investments every three months and evaluates the program itself.

EHP is one of the very few possibilities of local banks to provide financing for energy efficiency investments in Hungary. Most of the programs currently running are financed by international financial institutions (IFIs) leaving no space for local participation. It is not the size of foreign financing that keeps local banks far away from entering this field, but the cross-financing of programs, what IFIs do.

Feedback from municipalities looks satisfactory. According to the Ministry of Interior, the controlling ministerial level institution of municipalities in Hungary, EHP is helping speed up structural changes. Other advantages of the program mentioned by government officials are: EHP reduces import dependency, decreases pollution as well as the social burden, costs, sizeable multiplicative effects, such as creating jobs, improving import-export saldo, etc.

Being the only governmental energy efficiency program, EHP will surely go on and probably develop further. Although its second element - financing the modernisation of central heating - is coming true after three long years of negotiations and lobbying and the third element - third party financing - was refused in the end, the program has already witnessed some improvements. The credit line has been increased and from autumn 1999 on another HUF 1 billion will be credited for the central heating reconstruction program.

6.3.4 Building Network of Regional Energy Advisory Centres - SCORE Program

The SCORE program is the initiative of the Government of the Netherlands. SCORE ‘97 was based on the result (experience, network and advisory activity) of the ELÉG campaign, since the philosophy of the two programs were very similar to each other: coalition building, awareness raising.

A major aim of SCORE programs is to organise and establish a nation-wide energy efficiency advisory network that is independent from the actors of the energy market, namely the energy distributors. The network is to help local inhabitants, public institutions, small- and medium sized enterprises in energy efficiency decision making and provide technical and financial information and map out energy efficiency possibilities.

The general target of the SCORE program is to establish a sustainable energy efficiency infrastructure suitable for detecting all the initiatives aiming the continuous improvement of energy efficiency at end users. While SCORE ‘97 was planned to establish new institutions, building capacity, raising awareness and energy efficiency developments for demonstration, SCORE ‘98-99 has aimed at establishing the basis of an autonomous,

nation-wide system supporting energy efficiency activities locally as well. This network should work independently from any Dutch financial resource after the turn of the century. Besides opening local offices, a telephone service is also provided which was especially popular after information films were shown on TV.

It is a long term project since it was designed to "survive" the financially supported period, and spread the information, institutions further. Participants of the trainings should pass the newly gained knowledge, energy advisory offices sustain their activities by the help of local SMEs.

Members of advisory centres were "recruited" from very different organisations, providing a complex view of energy efficiency. Green NGOs and members of MTESZ (a natural science and engineering oriented organisation) could complement each other's knowledge and approach. Different ideas from the participants are circulating in the network, enriching the activity of others.

6.3.5 Energy Service Company (ESCO) – Prometheus

ESCOs are industrial companies with extensive expertise and experience in energy conservation. These companies are able to buy, install and maintain the energy-saving equipment need for their clients at their own initial expense. The invested money is returned by the real savings obtained. ESCOs are paid through contractual arrangements that convert the customers' saving from reduced energy cost to revenue.

In 1995, the European Bank for Reconstruction and Development signed a USD 5 million loan agreement with the formerly state-owned Prometheus, of which 97 % was owned by the Compagnie Général de Chauffe of France. The money was provided for renovations, new parts and safety devices, and also the operation and maintenance of energy installations in private sector businesses and public sector enterprises operating in Hungary. The first loan was followed by a new one two years later. The EBRD now has also got equity participation in the Prometheus. After the first two years, Compagnie Général de Chauffe and EBRD decided to set up other ESCOs in the region, for this reason the two institutions prepared USD 150 million. The other two partners of EBRD in similar projects throughout the CEE are Honeywell of the United States and Landiss & Gyr of Switzerland. The size of the co-operation equals USD 75 million and ECU 210 million, respectively. Owners of the Prometheus now are the French Vivendi Group and EBRD. The company is involved in about 400 programs. Yearly data of energy saving amounts to 176 400 GJ according to Prometheus, which means 20 % saving in energy bills

Private and public institutions have been able to participate in energy conservation investments by third party financing. This technique can supply organisations indirectly with the funding needed. Participation of the EBRD meant the inclusion of an IFI and also extra resources for the company at a time when foreign financing proved to be difficult and a risk taking institution was needed.

Prometheus has become a well established private company since its privatisation in 1992. It is expanding its activity. The EBRD is still on board as the bank's aim is to develop private entrepreneurship in the countries of its operation. And when its investments have "graduated" – as EBRD terminology defines favourable results - the bank leaves the company behind selling its stake. Progress is made in Hungary, where the EBRD has already sold its equity in two banks out of four it has been investing in as an owner.

6.4 Poland

6.4.1 Polish Efficient Lighting Project - PELP

The household share in the total energy consumption in Poland is very high in comparison with highly developed countries, and holds the potential for hitherto only partially exploited energy savings. Consideration of this fact has given rise to the idea of reducing domestic electricity consumption by replacing traditional filament-bulb lighting with the compact fluorescent lamps (CFL). Although the CFLs save energy there is lack of consumer awareness that the replacement of an incandescent lamp by a CFL is a profitable investment.

As a result of a market study in 1993, an electricity conservation program: The Poland Efficient Lighting Project (PELP) was developed by the International Finance Corporation (IFC) and funded with 5 million USD from the Global Environment Facility (GEF).

One of its main components was a demand-side management (DSM) pilot, which was designed to use CFLs to help introduce the concept of DSM to Polish electric utilities. The main objective of the project was to introduce the concept of using DSM to defer distribution and transmission investments and to demonstrate the potential benefits of a DSM program implemented in real field conditions. Specifically, the pilot aimed to reduce peak power loads in geographic areas where the existing electric power grid capacity was inadequate to meet existing electric loads or soon would be inadequate to meet future load growth.

The backbone of the DSM pilot was a CFL subsidy coupon system, which was designed to persuade large numbers of people in the selected areas to purchase and install CFLs. The CFLs sold through the pilot were subsidised with USD 100,000 of PELP project funds. A high level of CFL sales was achieved in the three cities: more than 33,000 CFLs were sold in six weeks. A large number of CFLs were sold per household, which is especially notable given the low average incomes of the areas involved. The savings achieved correspond to a 15 % - 16 % reduction in total electric peak demand.

The Polish Network "Energie Cites", has developed a project based on the methods and experiences of PELP/DSM, in which the massive CFL installation will be ultimately achieved without external subsidies. The PELP project provided also a model for the

GEF-IFC Efficient Lighting Initiative (ELI) being currently developed in 6 countries (South Africa, Argentina, Peru, Philippines, Hungary, Latvia and the Czech Republic.

6.4.2 City-wide Energy Efficiency Investments Plans

The Project's aim is to demonstrate that the development of the new business activity in implementing low-cost heat saving measures in buildings brings benefits to the local communities in several areas:

- social: improved housing conditions, creation of new jobs, new economic activity;
- economic: reduction of energy or fuel bills, or avoidance of supply-side investment costs;
- environmental: locally, by reduction of emissions from low pollution sources.

Six cities are selected for the project. They represent different regions, population, size and character. Among the project cities, there are such with high unemployment and retraining needs. The demonstration part of the project in each selected city consists of:

- complete heat audits performed by certified auditors in five selected buildings, with reports identifying possible measures and their cost-effectiveness;
- actual implementation of the recommended measures in those two buildings;
- post-demonstration heat-consumption data collection and analysis.

The buildings selected to the project include (for each city) a typical 4-5 story residential block and a school of a typical size.

The last step is elaboration of the City-Wide Plan for Energy-Efficiency Investments based on inspection of the existing building stock and heat sources, performed energy audits and results of the demonstration works. These plans list and prioritise the most needed and possible investments (according to the Least Cost Planning Principle). The applied measures include such low costs improvements as window carpentry repairs, weather-stripping, insulation of attic space, installation of radiator shields, insulation of selected external walls.

The other major goal of the project is creation of jobs. For this purpose in each city 8-14 local blue-collars are selected, typically from among unemployed local workers, who are trained on job by FEWE technicians.

The results so far are encouraging and prove that the project has addressed important local issues. In the four cities over 40 local technicians have been trained in the low-cost measures to save heat energy and four small companies have been established by the previously unemployed trainees. One prospering small local company has extended its scope of services to include the low-cost measures demonstrated in the project. One of the indicators is that the cites have exceeded their contribution to the project above the assumed 26%. Another indicator of success is that two other cites, having learned about the project, decided to send their technicians for training covering the costs of the train-

ing from their own resources. Companies from two other municipalities have asked for similar training on the same basis.

6.4.3 Wood-waste Combustion

The overall driving objective of the project 'Integrated Approach to Wood-waste Combustion for Heat Production in Poland' is to overcome barriers to wider and better use of biomass. Wood is considered by the general public, and (often) by the decision makers alike, to be a "backward" solution. This is a cultural barrier of a rather psychological nature. Wood as fuel is associated with cumbersome, old fashioned technologies, used for heating and cooking in countryside in the past. Replacing wood by coal has been ingrained in the public awareness as an indicator of progress. Coming back to this fuel is often perceived as step backwards.

An extremely important barrier is fear that wood waste is seen as an unstable source of energy. This is an overwhelming factor which most often excludes from consideration any full fuel switch to wood waste. Coal supplies have been safe and stable for decades. Also gas supplies were practically never interrupted, which is an important factor in consideration of replacing coal by gas.

Lack of information about technologies and insufficient number of good practice in-country examples, that would encourage potential project developers to consider the wood waste option in fuel conversion experiments.

Competition of other fuels: coal, particularly cheap coal, as a low cost fuel, that may (and in fact does) eliminate biomass from its natural niches (rich wood supply) leading to “petrification” of old practices. Gas and oil are also winning over biomass, because they are easily available and their supplies are stable. Another factor is lower labour (operational) costs which often offset higher fuel costs.

Another factor is aggressive marketing and promotion of fossil fuels. This applies to coal, gas and oil alike. Coal dealers offer attractive terms of delivery and payment competing with each other. On the other hand, gas and oil boiler suppliers and installers (most often representing western companies) provide credits and accept delayed payments which often allows the investor to avoid troublesome procedures of obtaining equivalent bank loans.

The project is a both, a pilot and demonstration project and an assessment of the most appropriate application of biomass technologies in Poland. Four different type of framework conditions are assessed within the project:

- Single wood-waste supplier linked by a long-term contract with single wood-waste buyer;
- Single large wood waste supplier and a number of heat buyers (district heat system).
- Many small wood waste suppliers and many scattered wood waste buyers.

- Self-supply: the wood waste producer converts its heating system from fossil fuel to wood-waste, produced by himself.

The first stage – financed by an GEF grant – included demonstration of an integrated approach in the city of Krapkowice. A window carpentry manufacturer Golenia Ltd. has signed a ten-year contract with the city for wood waste supply to a grammar school, which was previously heated by coal. The school was previously thermally renovated. After the thermal renovation the fuel reduction and reduction of the costs of heating are remarkable (30 - 40 %).

A number of other prospective projects has been identified and financing and implementation for three more of them will be included in the Maximum Size Grant Application that is going to be prepared for GEF.

6.4.4 Education and Training of Local Administrators

Energy efficiency projects, regardless where they are designed, are ultimately implemented locally. Therefore, the main political actors directly involved in the realisation of such projects are municipal decision-makers. It turns out, however, that the level of environmental awareness and knowledge about sustainability issues of those people is highly insufficient. A huge need exists for education and training of local governments, especially in small and medium sized cities, which luck potential and opportunity to train their cadres. The Polish Network >Energie Cites< (PNEC) was established to specifically address this target group.

The main objective of the project "Education and Training of Local Administrators in Sustainable Energy" has been to increase the level of environment and energy awareness of local decision makers. The projects' aim has been to provide those people the basic knowledge about technologies of CO_2 abatement and ways of developing and financing energy efficiency and renewable energy projects. The other objective is to help establish local capacity to develop and implement such projects. This objective was achieved by organising 16 training seminars in different parts of Poland dealing with four topics:

1. Strategic Energy Planing at the Municipal Level;
2. Possibilities of Financing Energy Efficiency;
3. Energy Saving in Lighting;
4. Heat Saving Potential and Measures in Buildings.

The total number of participants was 978 who represented 215 municipalities. Altogether 204 lectures were given. The project was financially supported through the Tempus Programme of the European Union.

A measure of the concrete knowledge how to identify and approach the energy problems has been the success of the cites, which trained their representatives in the CME seminars. The capacity to improve the energy efficiency at the municipal level created by the

project is best reflected by the increase of the membership of PNEC: 9 at the beginning and 31 at the and of the project. It should be also noted that the trainees included people who were later promoted to new positions: 38 mayors or deputy mayors and five members of the Parliament.

6.4.5 Energie Cites

Title: Capacity building project of the French agency ADEME (Agence de l'Environnement et de Maîtrise de L'énergie): Creation of Polish Network >Energie Cites<

The most important level of policy making and implementation in energy efficiency and renewable energies is the municipal level. This fact has been recognised in the European Union where several networks of cites or regions have been created to jointly promote sustainable energy. The leading force behind this effort has been the French agency ADEME (Agence de l'Environnement et de Maîtrise de l'énergie). It has created a network of European Union cites called "Energie Cites" with headquarters in Besancon - France. The same importance of local policy making in the field of energy applies also to countries in economic transition. The importance and gravity of problems in this subject is even greater in Central and Eastern Europe, because it is only the past decade that the local governments have been given a say in any decision making, being previously practically fully commanded by the central state and party apparatus.

The project objective was to create national capacity for joint actions aimed at promotion of sustainable energy policies at a municipal level. The first step was to identify such municipalities, which required a substantial effort to make reconnaissance in whole country. Initially 8 cites agreed to create the network

In 1993 FEWE Kraków received a grant of 200 000 FF to establish a network of cites in Poland whose governments showed interest in developing local energy policies aimed at minimising the impact of energy production and use on the environment. The statutory goal of the >Polish Network Energie Cites< is the promotion of rational and more efficient use of energy, particularly in the areas, which can be influenced by local authorities, these are: heating, gas and electricity supply, transport and local industry.

Currently, there are 33 municipalities associated in the Network and the number of members is still growing. Eleven members of the Polish Parliament have been involved in the work of PNEC. PNEC has run or has taken part in a number of energy efficiency and sustainable energy projects (now, in the range of several hundred thousand USD).

6.5 Slovenia

6.5.1 Wood biomass based DH in Gornji grad

Slovenia is very rich in wood biomass since it is by 55% covered by forests. In total premier energy supply wood represents around 5% while its share in supply of heat is

around 20%. However, wood is predominately converted to heat by obsolete inefficient, to users and environment unfriendly technologies. Until now the was only one wood biomass based district heating. The project aimed to install modern pilot and demonstration district heating, based on two 2 MW boilers, fired by waste wood, sawdust and/or wood chips, equipped with multicyclon and filters and thus fulfilling EU emission criteria considering emission of dust particles, CO and NO_x. The heat is from boiler house distributed to near wood processing factory, which is also largest supplier of wood biomass (wood wastes, sawdust) and a minor shareholder (25%) in municipal energy supply company ENGO Ltd., where it is used as process heat and to the district heating pipeline, which – when finished – is estimated to distribute heat to approximately 80% of the households of the small town of Gornji Grad. The whole process is regulated automatically and each household can regulate its own supply with heat. The project started by preparation of documentation in early 1995 and was facilitated through grants from the PHARE programme.

Main lessons learned are on the filed of project management, technical and financial engineering. With respect to the project management the main lesson is that without a mayor who is fully devoted to realisation of such a project its realisation is hardly possible. The other lesson is that the municipalities are very weak in knowledge and capacities on modern energy data collection and planning tools, energy management, financial engineering and management of decision making process. Since there are on the field of renewable energy no energy companies which have adequate technical, organisation and financial management skills and capital they can not offer - like gas distribution companies - "full project service" to the municipalities. Thus the transaction costs of the municipalities are very high - a barrier which for a time being could be overcome only by enthusiastic engagement of the mayor not challenged by strong business or political opponents. In order to overcome this obstacle the energy advisory service for local communities would be needed as well as incentives for creation of ESCOs on the field of renewable energy. Next lesson is that the without strict supervision the consultants and technical engineering companies - who's financial revenues are depending on the certain share of the total sum of the project - are tending to extend the projects over the optimal economics costs by respecting at very first technical limits and not economic performances. Final lesson might be that without establishment of local/regional biomass markets in case of dominant (single) supplier the contracted price for unit of wood biomass might be challenged because of the monopoly status of supplier.

6.5.2 Integrated Approach in Energy Efficiency in Heating in Fran Albreht Elementary School in Kamnik

Elementary school "Fran Albreht" is typical school building from early sixties. It was built without thermal insulation while before their replacement the windows had wooden frames, which were in large number already damaged. The heat was provided from its own 25 years old hot water boilers which needed to be replaced, too. During the project a number of activities has been carried out, targeting the improvement of energy

efficiency of heating system. The old boilers has been removed and the school connected to district heating. The roof has been thermally insulated and the windows and their frames replaced by insulated low heat emission ones. Thermostatic regulation valves of the radiators in building and the hot water pumps with the regulation of frequency have been installed. The school has been equipped with computer system for manipulation of the central regulation of the heating, measurement of energy consumption and monitoring of the energy processes. In addition the teachers and pupils have been informed about the advantages and importance of thermostatic regulation valves for user friendly temperature of the classrooms and for reduction of the heat loses.

The *most important lesson* is: if there is money available for the investment, energy efficiency investment with relatively short pay back period can be achieved. However the fact is that neither the school nor the municipalities have financial resources and both are restricted by the provisions of the Ministry of Finance for taking credits in energy efficiency investments even if the financial savings can be proved already on the mid-term. The third party financing would be under the existing laws and rules considered from perspective of Ministry of Finance as increased public indebtedness and thus not allowed.

The *second lesson* is: neither the school management nor the (other) users of school building (pupils, teachers, members of sport clubs etc.) are motivated for EE. The financial benefits which would result form energy savings which depend from their actions, activities and deeds would not be distributed to them neither on the level of the school as an institution such nor at the level of its constitutive parts (classes). On the other side it would be also very hard to connect the curriculum with the EE activities and investments in school - thus the environmental benefits of EE efficiency measures and investments which took place in the schools as a building are not related to school as an education "vehicle". The *third lesson* is: first after a central computer system of monitoring of the energy processes in school is built in the school management and maintenance staff can also focus on EE parameters while providing energy services.

6.5.3 Energy Conservation Strategy

Before the results of the project has been given there had not been a general and comparative assessment of the potential on efficient supply and use of energy as well as renewable energy in Slovenia but only partial sectoral or single case studies. The project has aimed to bring the "total picture" of the situation on the field. The energy saving potential in industry by branches and by technologies, energy conservation potential in building sector (divided into public buildings and households) by age, type of the building and by the climate zone and the energy supply of renewable energy by energy carriers by technology have been assessed at the level of the theoretical (technical) potential and at the level of the economically viable potential (on the level of the current, i.e. 1994 prices for energy, respectively energy carriers). The results from each single category has been summarised on different levels, thus enabling an assessment for each

technology, branch, type of buildings or energy carrier end an aggregated assessment on the level of the sector as well as, finally, the assessment of total potential of energy savings, energy conservation and renewable energy in PJ within the country. Parallel to the assessment of each single potential (by category) the barriers has been identified and the recommendation for removal of the barriers and future action programs has been made

The project has contributed to the transfer of know how in how to deal with an integrated approach in energy conservation. Perhaps even more important that the transfer of skills and methodology of the assessment of each single category of the study has been the transferred of strategic knowledge that despite differences in sectors, energy carriers and technologies the energy conservation options are socially much more shaped by their desegregated and dispersed structure so that the differences in sectors and methodological approaches must be overcome in order to remove the barriers for the potential on the field. The actors has learned that they have to co-operate in order to create a positive sum game on the field, however they have not learned how to co-operate and how to design the positive sum game.

6.5.4 Networking and Training of Energy Advisers

Although the had been some consumer's advisory activities and initiatives on the field of energy previous to the project, the project which started in 1994 for the first time brought into being a nation-wide network, common rules and standards as well as the "branch mark" of the energy advisory service (EN-SVET - this denominator is at the same time in Slovene language the abbreviation for energy advisory and it has the meaning of "one world"). Energy advising practitioners has been given a common knowledge and training in energy processes, energy conservation and energy advising. The activities of energy advisers has been certified, supported and promoted. A media promotion campaign has been launched. Additional training and distribution/exchange of information and experience has been organised as well as systematic evaluation of the results and performance of energy advisory activities. First the program had been performed and co-ordinate by The Institute of Civil Engineering, after 1995 when the Agency of RS for Energy Efficiency was established it took over also the role of co-ordination and evaluation of the activities.

One of the most important lessons is that energy auditing needs permanent promotion and "marketing" activities. This can not be covered and carried only by energy advisers. The second lesson is that the energy advisers needs regular and permanent exchange not only of information but also of the experience (and problems) they have in order to create a kind of professional group identity and professional ethics. Clear rules, financial support and the system of monitoring and control has to be establish in order to prevent the energy advisory activities to serve as a hidden marketing and/or promotion of certain company or its services/ products. If there is a lack of energy efficient products on the market or there is no adequate system of energy labelling of the products the energy advises can have only a limited impact on the consumer's choice, especially on the field

of household appliances. Last but not least, the consumers are looking for a complete service with respect to investment in energy efficiency and not only for a technical advises and are thus demanding also support in understanding of state and commercial schemes and procedures for getting subsides or credits under favourable conditions.

6.6 Results and Findings

6.6.1 Project Categories

Not surprisingly the set of projects selected as best practice contains a broad spectrum of rather different projects. The selected projects differ with regard to partners, donors, size, objectives and category. However, although each project is different from the others some common patterns and categories can be identified. Table 10 gives an overview of the projects selected for each of the Accession Countries and shows also a categorisation of theses projects.

Table 10: Best Practice Project of Existing Co-operation

Projekt	Category
Czech Republic	
1 PHARE Energy Saving Fund	Credit Fund
2 Programme/ Fund MUFIS (Financing of Municipal Infrastructure)	Credit Fund
3 Energy Efficiency Centres	Institution Building
4 Project Development	Market Procurement
Estonina	
1 Procurement of Ambient Air Quality Monitoring Equipment	Adminstrational Support
2 Capacity 21 in Estonia	Capacity Building
3 National Environmental Action Programme	Strategy Development
4 Establishment of Regional Energy Centres	Institution Building
5 Local and regional energy planning	Adminstrational Support
Hungary	
1 Energy Saving Credit Fund - Energiatakarékossági Hitel Alap (EHA)	Credit Fund
2 Energy Efficiency Program - ELÉG	Awareness Campaign
3 Energy Saving Credit Program - Energiatakarékossági Hitel Program (EHP)	Credit Fund
4 Building Network of Regional Energy Advisory Centres - SCORE Program	Institution Building
5 Energy Service Company (ESCO) - Prometheus	Market Procurement
Poland	
1 Polish Efficient Lighting Project	Market Procurement
2 City-wide Energy Efficiency Investments Plans	Adminstrational Support
3 Wood-waste Combustion	Technology Promotion
4 Education and Training of Local Administrators	Capacity Building
5 Energie Cites	Institution Building
Slovenia	
1 Wood biomass based DH in Gornji grad	Technology Promotion
2 Integrated Approach in Energy Efficiency in Heating in Fran Albreht Elementary School in Kamnik	Technology Promotion
3 Energy Conservation Strategy	Strategy Development
4 Networking and Training of Energy Advisers	Institution & Capacity Building

Although each project has been categorised to one of the categories described below they often contain also elements of other categories or are even a mixture of several categories:

- Credit Funds: Several credit funds were selected as best practice projects (Czech Republic, Hungary). These credit funds were initially financed by foreign donations and are designed to finance energy efficiency improvements or rehabilitation and development of infrastructure. Some of the funds are carried out as revolving funds. These funds continue to work if the bilateral or multilateral co-operation project is finished jet.
- Technology Promotion: Foreign assistance was used to develop pilot and demonstration projects which apply new, advanced technologies or equipment that has not been used before in the country. In two cases these pilot projects addressed biomass (Poland, Slovenia), in another case a whole bunch of different energy efficiency technologies were applied in one object to demonstrate the entire spectrum of options to reduce energy consumption (Slovenia). Aim of these pilot projects is to reduce scepticism about these technologies and to gain experience which can be used to identify the necessary adoptions of these technologies for domestic purposes.
- Market Procurement: Some technologies or strategies are already known in the country but are not applied intensively due to market or other barriers. Market procurement projects are designed to overcome these barriers. Market procurement projects may address specific technologies like efficient lighting with compact fluorescent lamps (Poland), facilitate the development of market actors through the initial support of ESCOs (Hungary) or assist project development by providing information on financial resources and on project administration (Czech Republic).
- Awareness Campaigns: Energy saving is not only a matter of technology and economy but also a matter of attitudes and habits. Awareness campaigns (Hungary) are designed to address the latter aspects. They may include mass media campaigns and address relevant actors directly (pupils, utilities, journalists etc.).
- Strategy Development: Detailed information the status quo of the energy sector as well as on the energy saving potential are crucial for the development of a national energy strategy or an environmental plan (Estonia). But gathering all these information may also help to draw the "total picture" (Slovenia) which itself can be used to identify and develop adequate pilot and co-operation project.
- Administrational Support: Local and regional administration play a key part in the sphere of environment and energy as the are responsible for important elements of that sphere (public buildings, grids, environmental compliance control etc.). The administrational bodies may be supported through improvement of compliance control equipment (Estonia) or through training in energy efficiency project development, preparation and implementation (Estonia) or the elaboration of city wide energy development plans (Estonia, Poland).

- Institution Building: Independent institutions and energy efficiency centres can promote and facilitate interest and motivation for energy efficiency in general and, thus, contribute substantially to environmental improvements. As adequate institutions and networks are crucial for progress in the sphere of environment and energy institution building projects were selected as best practice projects in all Accession Countries. Besides, institution building and networking often is simultaneously training of the people involved in these projects. Therefore some of the best practice projects combine institution with capacity building.
- Capacity Building: Both, institutions and processes depend on people and their knowledge and capabilities. Possibly the most crucial issue, in particular for countries in transition like all Accession countries, is the training and capacitating of people to identify and realise energy efficiency options. Capacity building projects can be targeted to people form local or national administration (Estonia, Poland) or to people from independent institutions or non governmental organisations (Slovenia).

These project categories are different with regard to their objectives, the actors they are addressed to and their need for financial resources from abroad. Credit funds need substantial amounts of financial assistance whereas institution and capacity building often can be realised with relatively small financial resources.

6.6.2 Players

Two categories of players can be distinguished: the players that carry out the co-operation project and who are responsible for the implementation on one side and the target goups of the projects on the other side. However, in some projects both categories are represented by the same group.

Several projects are targeted to private households and the residential sector (e.g. efficient lighting, district heating). The commercial sector is less often explicitly addressed in the selected projects although some of the projects are targeted to the residential & commercial sector in general. Municipalities and regional or national administrations are often both, target group of the project and simultaneously responsible for the implementation of the project.

Industry is in non of the selected projects explicitly addressed. This probably has two reasons: projects in the industry sector often are better characterised as technical assistance which requires substantial financial resources than as bilateral co-operation projects. Moreover, the industry sector is most affected by the transition process. Energy efficiency improvements that seem to be promising might be not because the perspectives of the plant or production site itself in very insecure. With other words, efficiency potentials in industry are not robust due to still significant impacts of the transition process on the industry sector in the Accession Countries.

The old energy sector (utilities, power plants etc.) is also not addressed directly in the selected best practice projects although it is involved in some of the projects. However, new players in the energy sectors like energy service companies or project developers are target of some of the selected projects. Theses new players often could better cope with the new challenges of the energy markets and liberalisation than representatives in the traditional energy sector institutions.

Some of the projects, in particular the credit funds are not targeted to any specific group but to all players that use or produce energy.

Mainly two groups of players are involved in preparation and implementation of the selected best practice projects. These are municipal and regional administrations and non governmental organisations (NGOs) that work in the sphere of environment and energy. The behaviour and activities of administrative people often are restricted to the competencies of the organisations they are working with whereas NGO people more frequently can apply new approaches to the issues of such co-operation projects.

6.6.3 Other Findings

Existing initial personal contacts are a major prerequisite for a good outcome of a project. In some cases a project has been initiated in a hurry, finding the partners only at the eleventh hour without having any personal beforehand knowledge of them. If during the project work has been discovered that the choice has not been the right one, it usually has fired back rather hard on the outcome of the project. Therefore co-operation projects that facilitate the building of multilateral networks in the sphere environment and energy often also promote the development of good designed follow up projects.

Local interest is very crucial factor for success of a project. If a project has been initiated and conducted only by high officials in a ministry without involving local interest groups, the outcome of the project has been often rather poor.

A majority of the players still have professional background in natural sciences or/and in technology, but few theoretical understanding of economics and social processes. In majority they are coming from national (ex) quasi-state institutions or dominant energy consultancy-engineering companies. Thus they also prefer "concrete technical solutions" over the abstract conceptual or institutional issues.

Not enough attention has been given to raise communication skills of the energy efficiency experts, advisers and practitioners to communicate with different target groups and to raise abilities to identify potential allies and make partnership within a broader field of "sustainable development".

Generally speaking while a lot of attention has been given to raise understanding and skills on new technologies, organisation schemes, energy planning, efficiency, conservation assessment few attention has been given to raise the communication skills and understanding of their importance for design and implementation of energy efficiency programmes and projects.

6.6.4 Recommendations

Due to the lack of financial means for the improvement of energy efficiency a substantial share of the energy saving potential in the Accession Countries can not be realised. However, financial resources are limited in European Countries too and thus financial transfers to Accession Countries. Successful co-operation is not only depending on the amount of money transferred but also on the way how the for co-operation projects available resources are used to fulfil the needs of the Accession Countries.

Some considerable recommendations for future co-operation projects can be derived from the analysis of existing co-operation projects.

Apart from costly hard ware and financial assistance lots of 'soft' measures and projects do have a remarkable and sustainable impact on the domestic sphere of environment and energy in the Accession Countries. Such measures like institutional support, capacity building or administrational support often can be carried out with relatively small budgets. Although their impact on the environment might be difficult to evaluated, it should not be neglected because it might be more sustainable than various technical assistance projects.

However, the analysis of the existing 'soft' co-operation projects has shown that such projects should comply with several conditions stated below:

- They rather should mobilise internal resources and capacities than intrude strategies and concepts from outside.
- The design of such projects should be such, that they can be continued independently and without financial support after the initial co-operation phase.
- For institutions and networks building adequate and advanced equipment is crucial (computer- and communications technology, offices etc.).
- Training and education on the job should be preferred to separate education schemes.
- Local authorities should be involved from the beginning in design and implementation co-operation projects. Top down planned projects are more likely to fail.
- Training should stress economic and management issues as well as the understanding political processes rather than technical or scientific issues.
- Apart from competencies directly linked to energy efficiency it is important to support indirect necessary capabilities such as communication and presentation skills as well as language skills.

Since the beginning of nineties several energy efficiency centres have been established in the Accession Countries. These centres were established with time-limited financial support and on the base of various pilot projects that had to be performed. The national experts are enabled through these pilot projects get familiar with the aspects of performing energy projects the an effective way. Foreign supporters do not manage the en-

ergy efficiency centres, the centres are only advised how to perform project, how to obtain information, how to manage the business connected with energy efficiency enterprise etc. The main goal of established national centres is to obtain experiences from the pilot project in order to continue and manage the energy efficiency activity after the time-limited financial support expires.

Various issues can be treated in theses pilot projects. However, most important are issues like market procurement for energy efficiency technologies, economics of energy efficiency and new approaches to liberalised energy markets such as third party financing, Contracting, energy service companies, demand side management. Moreover these pilot projects may include issues like renewables or upcoming issues like Flexible Mechanism within the Kyoto Protocol, in particular Emissions Trading and Joint Implementation.

7 Conclusions and Recommendations

More than four years the European Union (EU) decided to start negotiations with possible new member countries about accession. Czech Republic, Estonia, Hungary, Poland and Slovenia are the first countries which were accepted to perform the formal accession process.

Taking into account the leading role of the EU in general as well as of individual countries like Germany in climate protection policies and strategies it is important to consider the impact of the accession process on the European climate policy. Moreover, if options for harmonisation of environmental and in particular climate policies can be identified early during the accession process future adoption and harmonisation might be performed strategically and less costly. Member states of the European Union may support this adoption processes through financial assistance as well as through 'soft' co-operation projects.

Performance in the Sphere of Environment and energy

The analysis of the status quo in the sphere of environment and energy showed that there are several options and starting points for CO_2 mitigation strategies in each Accession Country. However, some of them are more adequate in one country, others in another country: Carbon intensity in Czech Republic, Estonia and Poland is still very high compared to the EU average. Conversion efficiency got worse in Estonia during the nineties. Energy intensity of all Accession Countries is well above the European average. Apart from Estonia it did not improve substantially in any Accession Country but even got worse in Slovenia.

In general the analysis has shown, that economic development and energy intensity are the most important driving forces. As economic development is a parameter not a variable for GHG mitigation policies energy intensity should have a key role in any GHG mitigation strategy. Influences of carbon intensity on the development of CO_2 emissions are substantially but lower than influences of energy intensity. The conversion efficiency seems to bee the least important driving force. Nevertheless, policies and measures to improve the conversion efficiency should not be neglected.

Accession Process and Legal Gaps

It is hardly surprising that several years prior to the formal accession of the Czech Republic, Estonia, Hungary, Poland and Slovenia, there remain significant gaps in the implementation of the requirements of EC law in the field of environment and energy. Progress appears to be generally most advanced with respect to institutional and procedural requirements (with notable exceptions, see below). Most of the accession countries have established the necessary institutions, competence's and administrative procedures to assign responsibility to specified authorities and fulfil the formal conditions for effective enforcement. It has to be mentioned, however, that institutional capacity (per-

sonnel, training etc.) in many instances needs to be strengthened in order to live up to the implementation and enforcement challenge in reality. This is particularly true for the monitoring and reporting requirements of several Directives.

The most serious legal gaps exist with respect to the following issues: substance, including the opening of energy markets to "eligible customers"; energy tax definitions and levels; energy efficiency standards of household appliances; and application of emission limit values to specific installations. In the case of the IPPC Directive, the major requirements are of a procedural nature. As a consequence (and exception of the aforementioned rule), the major difficulties in the implementation of this Directive are also related to procedures. As a common feature among accession countries, the integrated approach pursued through the IPPC Directive is unknown in these countries. It thus poses a particular challenge in all accession countries (but also in many EU Member States). In particular, it will not only require establishing new legislative conditions but also restructuring environmental administrations and procedures. More problems can thus be expected to occur in the implementation of the IPPC Directive in the future.

Summing up the whole field of environment and energy it must be concluded that most efforts have been focused on the liberalisation of the electricity and the gas market. Although progress has been made, further adjustments are necessary aiming at an open market in electricity and gas especially concerning third party access to the transmission and distribution systems. In practice in several countries, monopolistic structures are still prevailing although the legislative acts have been aligned (Czech Republic, Hungary).

Energy taxation according to the Directive on excise duties on energy products will pose a problem in most of the Accession Countries. Although for most of the energy products some sort of taxes are levied, with the exception of the Czech and Estonia which do not impose taxes on kerosene and liquid petroleum, the level of the taxes do not (yet) correspond to the minimum levels required in the EC legislation. In this respect Slovenia seems to be further advanced in imposing taxes for some cases higher than the European ones. In the other countries the problem of excise taxes will be further aggravated with the adoption of the proposed amendment of the Directive planning to include additional energy products as well as rising the minimum levels of taxation.

The situation with respect to the rules on energy efficiency is diverse. Whereas in the Czech Republic, Estonia and Hungary only basic rules exist concerning the labelling of products or programmes implementing the SAVE Directive it seems that Poland faces less problems. In Slovenia legislation to further detail the existing acts has to be adopted to be in full compliance with the EC rules.

The degree of harmonisation seems to be most advanced in all the countries regarding the Large Combustion Plant Directive. All the countries apply an authorisation system for new and existing plants and can profit from the low emission levels caused by the industrial decline. This is however to be taken into account during the accession talks setting national emission reduction targets for each of the Accession Countries.

Overall large gaps still remain with respect to relevant EC legislation in the field of environment and energy in the Accession Countries. In no one country or in any of the areas where EC Directives exist are the requirements completely fulfilled. In all Accession Countries, the main or framework legislation has been introduced recently or is planned to be introduced in the near future. However further action is required by issuing supplementary legislative acts (like government decrees or ordinances) building the basis for administrative implementation and enforcement.

All of the analysed Accession Countries seem to face more difficulties than expected considering the speed of the legislative process. Given this experience of the past it seems probable that the envisaged timeframes for the full implementation of the EC legislation in the field of environment and energy of the year 2001-2003 will not be met. Transition periods for more than the requested Directives will be negotiated in the accession talks. It is therefore likely that the approximation in the Accession Countries will be in process for much longer than the date of accession.

Patterns of Regulation

The synopsis of policy analysis reveals common characteristics in the field of policy styles. Major weaknesses in all countries are for instance, a rather low level of dialogue and consensus orientation or a predominance of command-and-control in decision-making. Regarding the actor configurations in the field of environment and energy, the analysis illustrates that both intra- and cross-sectoral policy integration are rather poor and not effectively practised.

Further shortcomings are underdeveloped networking activities, both among regulated stakeholders and between regulators and regulated stakeholders. Several countries have established already functioning and innovative networks of energy efficiency institutions on the central and regional/local state level. These networks, however, require stabilisation and extension.

There are clear differences between the countries in terms of policy instrumentation. Several countries, such as Poland and to a lesser extent the Czech Republic and Slovenia, have endorsed a relatively diversified policy mix. The strategic orientation of the policy tools, however, is mostly lacking. Innovative strategic concepts, such as National Environmental Action Plans, have been adopted in most countries only recently. It is too early, yet, to judge their effectiveness and performance. Only in Poland, the incentive effect of economic instruments is on a high level. The Polish pollution charge system has generally become regarded as a model in the region for successfully implementing economic instruments for raising earmarked investment funds.

In order to overcome the specific difficulties of the applicant countries on their way to EU membership, we strongly recommend to support and strengthen their efforts by effective capacity building. The possibilities to influence policy styles in a country are very limited, because these are subject to changes only in the long-term.

An area, which offers favourable conditions for assistance and which is of strategic importance to the applicant countries, is to our opinion, the transformation of actor constellations by *developing capacities through networking*. This refers to networking activities between state actors and affected interest groups, as well as networking in the informal sector encompassing pro-active members of civil society, including scientists and engineers from the techno-economic community. Particularly, the municipal level has been fairly neglected so far. The already existing initiatives (e.g. in Slovenia, Poland, and the Czech Republic) and coalitions might serve as multiplicators for creating stable innovation networks.

In addition, we suggest to build up and extend the cognitive-informational capabilities by enforcing networking and co-operation in the field of education and awareness-raising. Support to grass-root initiatives concerned with energy saving and renewable energy sources, which might disseminate individual experience regionally or even country-wide, could initiate innovative networks. By favouring the networking approach, we plead to develop the capacities for capacity-building.

Existing and future co-operation

Due to the lack of financial means for the improvement of energy efficiency a substantial share of the existing energy saving potential in the Accession Countries can not be developed. However, financial resources are limited in European Countries too and thus financial transfers to Accession Countries. Successful co-operation is not only depending on the amount of money transferred but also on the way how the resources available for co-operation projects are used to fulfil the needs of the Accession Countries. Some considerable recommendations for future co-operation projects can be derived from the analysis of existing co-operation projects.

Apart from costly hard ware and financial assistance lots of 'soft' measures and projects do have a remarkable and sustainable impact on the domestic sphere of environment and energy in the Accession Countries. Such measures like institutional support, capacity building or administrational support often can be carried out with relatively small budgets. Although their impact on the environment might be difficult to evaluated, it should not be neglected because it might be more sustainable than various technical assistance projects.

A successful example for such a 'soft' measure are energy efficiency centres which have been established in some of the Accession Countries. These centres were initiated with time-limited financial support and on the base of various pilot projects that had to be performed. The national experts are enabled through these pilot projects get familiar with the aspects of performing energy projects the an effective way. Foreign supporters do not manage the energy efficiency centres, the centres are only advised how to perform project, how to obtain information, how to manage the business connected with energy efficiency enterprise etc. The main goal of established national centres is to obtain experiences from the pilot project in order to continue and manage the energy efficiency activity after the time-limited financial support expires.

Various issues can be treated in theses pilot projects. However, most important are issues like market procurement for energy efficiency technologies, economics of energy efficiency and new approaches to liberalised energy markets such as third party financing, Contracting, energy service companies, demand side management. Moreover these pilot projects may include issues like renewables or upcoming issues like Flexible Mechanism within the Kyoto Protocol, in particular Emissions Trading and Joint Implementation.

8 References

79/530/EEC: Council Directive of 14 May 1979 on the indication by labelling of the energy consumption of household appliances (Official Journal L 145, 13/06/1979 p. 0001)

79/531/EEC: Council Directive of 14 May 1979 applying to electric ovens Directive 79/530/EEC on the indication by labelling of the energy consumption of household appliances (Official Journal L 145, 13/06/1979 p. 0007-0015)

88/609/EEC: Council Directive of 24 November 1988 on the Limitation of emissions of certain pollutants into the air from large combustion plants (Official Journal L 336, 07/12/1988 p. 0001-0013)

92/42/EEC: Council Directive of 21 May 1992 on efficiency requirements for new hot-water boilers with liquid or gaseous fuels (Official Journal L 167, 22/06/1992 p. 0017-0028)

92/75/EEC: Council Directive of 22 September 1992 on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances (Official Journal L 297, 13/10/1992 p. 0016-0019*)*

92/82/EEC: Council Directive of 19 October 1992 on the approximation of the rates of excise duties on mineral oils (Official Journal L 316, 31/01/1992 p. 0019-0020)

93/76/EEC: Council Directive of 13 September 1993 to limit carbon dioxid emissions by improving energy efficiency (SAVE) (Official Journal L 237, 22/09/1993 p. 0028-0030)

94/2/EC: Commission Directive of 21 January 1994 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric refrigerators, freezers and their combination (Official Journal L 045, 17/02/1994 p. 0001-0022)

95/12/EC: Commission Directive implementing Council directive 92/75/EEC with regard to energy labelling of household washing machines (Official Journal L 136, 21/06/1995 p.0001-0027)

95/13/EC: Commission Directive of 23 May 199 5 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric tumble driers (Official Journal L 136, 21/06/1995 p.0028-0051)

96/57/EC: Directive of the European Parliament and of the Council of 3 September 1996 on energy efficiency requirements for household electric refrigerators, freezers and combination thereof (Official Journal L 236, 18/09/1996 p. 0036-0043)

96/60/EC: Commission Directive of 19 September 1996 implementing Council Directive 92/75/EEC with regard to energy labelling of household combined washer-driers (Official Journal L 226, 18/10/1996 p. 0001-0027)

96/61/EC: Council Directive of 24 September 1996 concerning integrated pollution prevention and control (Official Journal L 257, 10/10/1996 p. 0026-00

96/92/EC: Directive of the European Parliament and the Council of 19 December 1996 concerning common rules for the internal market in electricity (Official Journal L 27, 30/01/1997, p. 20)

97/17/EC: Commission Directive of 16 April 1997 implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers (Official Journal L 118, 07/05/1997 p. 0001-0025)

98/11/EEC: Directive of 27 January 1998 applying to energy labelling of household Light bulbs (Official Journal L 71, 10/03/98)

98/30/EC: Directive of the European Parliament and of the Council of 22 June 998 concerning common rules for the internal market in natural gas (Official Journal L 204, 21/07/1998 p. 0001-0012)

Blazejczak J./Edler, D./Hemmelskamp, M./Jänicke, M. 1998: Environmental policy and innovation - An International comparison of policy pattern and innovative impacts, in Klemmer, P. (ed) Innovation and the environment . Case studies on the adaptive behaviour in society and the economy, Berlin: Analytica 1999, p. 9 - 31.

COM (99) 212: Amended Proposal for a Decision of the European Parliament and of the Council adopting a multi-annual programme for the promotion of renewable energy sources in the Community (1998-2002)

COM(95) 369: Proposal for a Council Directive to introduce rational planning techniques in the electricity and gas distribution sectors (Official Journal C 001, 04/01/1996 p. 0006)

COM(97) 30: Proposal for a Council Directive restructuring the Community framework for the taxation of energy products (Official Journal C 139, 06/05/1997 p. 0014*)*

COM(97) 514 final: A Community Strategy to Promote Combined Heat and Power (CHP) and to Dismantle Barriers to Its Development (Communication from the Commission to the Council and the European Parliament)

COM(97) 599 final: European Commission 1997b: Energy for the Future: Renewable Sources of Energy. White Paper for a Community Strategy and Action Plan

DG XI 1998: Guide to the Approximation of European Union Environmental Legislation, (http://www.europa.eu.int/comm/dg11/news/enlarg/index.htm)

DG XVII (Directorate General for Energy) 1999: Energy in Europe, 1999 – Annual Energy Review. Brussels

Fagin, Adam/Jehlicka, Petr 1998: Sustainable Development in the Czech Republic: A Doomed Process? In: Baker, Susan/Jehlicka, Peter (Eds.) 1998: Dilemmas of Transition. The Environment, Democracy and Economic Reform in East Central Europe. Frank Cass. London, Portland 1998, pp.113-128

FIU (Forschungsverbund Innovative Wirkungen umweltpolitischer Instrumente) (Eds.) 1999: Innovation Effects of Environmental Policy Instruments. Project Summary. 1999

Hronec, Andrej 1999: Energy Legislation in the Czech Republic – Steps towards the EU Model. In: Journal of Energy & Natural Resources Law, Vol.17, No.1, pp. 85-93

IEA (International Energy Agency) 1996: Energy Balances of Non-OECD Countries 1993 - 1994. Paris

IEA (International Energy Agency) 1997: Energy Balances of Non-OECD Countries 1994 - 1995. Paris

IEA (International Energy Agency) 1998a: Energy Balances of Non-OECD Countries 1995 - 1996. Paris

IEA (International Energy Agency) 1998b: Energy Prices and Taxes. Paris;
cited according to: E.V.A. (Energieverwertungsagentur) 1998:
http://www.eva.wsr.ac.at/enz/preise/evp-es.htm, 21.12.98

Jänicke, Martin 1997: Umweltinnovationen aus der Sicht der Policy-Analyse: vom instrumentellen zum strategischen Ansatz der Umweltpolitik. FFU-Report 97-3. Forschungsstelle für Umweltpolitik. Berlin

Klarer, Jürg/Lehocki, Zsusa 1999: CEE Regional Analysis. In: Klarer Jürg/McNicholas, Jim/Knaus, Eva-Maria (Eds.): Sourcebook on Economic Instruments for Environmental Policy. Central and Eastern Europe. The Regional Environmental for Central and Eastern Europe. Szentendre, Hungary

Kocenda, Evzen/Cabelka, Stepan 1999: Liberalisation in the Energy Sector in the CEE-Countries: Transition and Growth. In: Osteuropa-Wirtschaft, Vol. 44, No. 1, pp. 104-117

KPMG 1998: Environmental Policy and the Role of Foreign Assistance in Central and Eastern Europe. Copenhagen

McNicholas, Jim 1999: Poland provides the right incentives. In: REC The Bulletin 9/1 (http://www.rec.org/REC/Bulletin/Bull91/PolishIncentive.html)

MOP (Mittel- und Osteuropa Perspektiven)1999: Jahrbuch 1999/2000, Band 1 – Politischer Hintergrund und Wirtschaftentwicklung. Herausgegeben von: F.A.Z.-Institut für Management, Markt, und Medieninformationen GmbH et al., Frankfurt/Main

OECD (Organisation for Economic Co-operation and Development) 1999: National Climate Policies and the Kyoto Protocol. Paris

OECD 1997: Reforming Environmental Regulation in OECD Countries. Paris

REC (The Regional Environmental Center for Central and Eastern Europe) 1998: Doors to Democracy. Current Trends and Practices in Public Participation in Environmental Decision-Making in Central and Eastern Europe. Budapest

Richardson J.J., (Ed.) 1992: Policy Styles in Western Europe. London

Ricken, Christian 1997, Determinanten der Effektivität der Umweltpolitik. Frankfurt a.M.

Sejak, Josef 1998: The Case of the Czech Republic: Energy Policy and EU Adjustment. In: Müller, Friedemann/Ott, Susanne (Eds.): Bridging Divides – Transformation in Eastern Europe: Connecting Energy and Environment. Baden-Baden, pp. 87-112

UNFCCC (United Nation Framework Convention on Climate Change) 1999: Inventory Database, as of October 1, 1999. Bonn

World Bank 1999: World Development Indicators on CD. Washington