

# IN-DEPTH REVIEW OF ENERGY EFFICIENCY POLICIES AND PROGRAMMES



# CZECH REPUBLIC





# In-Depth Review of Energy Efficiency Policies and Programmes of the Czech Republic

Energy Charter Protocol on Energy Efficiency  
and Related Environmental Aspects (PEEREA)





## INTRODUCTION

The Energy Charter Treaty was signed in December 1994 and entered into legal force in April 1998. To date the Treaty has been signed or acceded to by fifty-one states<sup>1</sup>. The Treaty was developed on the basis of the European Energy Charter of 1991. Whereas the latter document was drawn up as a declaration of political intent to promote East West energy co-operation, the Energy Charter Treaty is a legally binding multilateral instrument covering investment protection, liberalisation of trade, freedom of transit, dispute settlement and environmental aspects in the energy sector.

The Energy Charter Conference, the governing and decision making body for the Energy Charter Treaty, meets on a regular basis normally twice a year to discuss policy issues affecting East West energy co-operation, review implementation of the provisions of the Treaty, and consider possible new instruments and projects on energy issues. All states who have signed or acceded to the Treaty are members of the Conference. Regular meetings of the Conference's subsidiary groups on transit, trade, investment and energy efficiency and environment are held in between Conference meetings.

### THE ENERGY CHARTER PROTOCOL ON ENERGY EFFICIENCY AND RELATED ENVIRONMENTAL ASPECTS

The Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA) is a legally binding instrument that was signed together with the Energy Charter Treaty in December 1994 by the same fifty-one states that signed the Treaty itself. It requires its Signatories to formulate energy efficiency strategies and policy aims, to establish appropriate regulatory frameworks, and to develop specific programmes for the promotion of efficient energy usage and the reduction of harmful environmental practices in the energy sector.

Implementation of PEEREA is kept under review and discussion by the Energy Charter Working Group on Energy Efficiency and Related Environmental Aspects. A key feature of the Working Group's activities is the development of a series of in depth reviews of individual states' energy efficiency policies and programmes. Recommendations to the authorities of the states concerned

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<sup>1</sup> Albania, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, European Communities, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Mongolia, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The Former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, Uzbekistan, United Kingdom.

resulting from these in depth reviews are presented to the Energy Charter Conference for discussion and endorsement.

For further information on PEEREA and the in depth energy efficiency review series, contact Mr Tudorel Constantinescu at the Energy Charter Secretariat in Brussels (Tel: +322 775 9854).

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# EXECUTIVE SUMMARY

## BACKGROUND

The Czech Republic is a landlocked country that lies between Austria, Germany, Poland and Slovakia in Central Europe. The Czech Republic became an independent country on 1 January 1993, having split from the former Czech and Slovak Federal Republic. The Czech Republic is one of the transition economies joining the European Union in May 2004.

The Czech Republic is highly dependent on imports of hydrocarbons (oil and gas), although it has large reserves of solid fuels, particularly lignite. Nuclear energy accounts for a high share of electricity generation, especially since the opening of the Temelin nuclear plant in 2001. The country has some potential for renewable energy, with the small hydropower potential capacity partly exploited and limited wind resources, but reasonably good biomass potential.

The economy is quite robust. The industrial sector is a major driver of the economy based on foreign investment. While still dependent on energy-intensive industries, the Czech economy is moving towards services. Services represented 58% of GDP in 2002, followed by about 36% for industry and 5% for agriculture. The main industries are metallurgy, machinery and equipment, motor vehicles, glass and armaments. Given its location in Central Europe, the Czech Republic is important for the transit of natural gas, oil and electricity. It is also important for the transit of road freight.

The energy supply industries have gone through extensive restructuring and privatisation in recent years with the gas and electricity sectors having been unbundled and an independent energy regulator established to promote competition and protect consumer interests.

Energy intensity is still high compared to EU countries, although it has been on a downward trend throughout the 1990s and early this decade. Industry is the largest energy consumer 42%, followed by transport at 23%, the residential sector at 20% and other sectors at 15%.

## ENERGY POLICY SETTING

Preparing national energy policy is the responsibility of the Ministry of Industry and Trade, with many other ministries and government bodies involved in both policy development and implementation. In policy formulation and implementation the Ministry of Industry and Trade is supported by the Czech Energy Agency, mainly in the field of energy efficiency and renewables.

National energy policy is largely being driven by EU energy policies and follows the same broad goals:

- ✧ achieving security of energy supplies;
- ✧ ensuring competitiveness of the economy; and
- ✧ protecting the environment while respecting the principles of sustainable development.

In January 2000, the Government approved the current National Energy Policy. The policy set a long-term framework for the energy sector with the aim of developing the necessary legislative and economic framework to encourage energy producers and distributors to act in an environmentally-friendly manner. The policy included price and tariff reforms as well as the promotion of energy efficiency, renewable energy sources and cogeneration.

The Ministry of Industry and Trade has recently developed an update of the Energy Policy. The draft energy concept was submitted to the Government in December 2003.

The 2000 National Energy Policy called for the final removal of subsidies and cross-subsidies in 2002 and that has effectively been achieved. Price reform was accompanied by a range of taxes and levies. The Ministry of Environment is currently preparing for a ecological tax reform scheduled to be proposed in 2004.

Energy efficiency policy has a long-term objective of reducing both energy and raw material intensities and to get these intensities closer to the levels achieved in highly industrialised countries. Energy intensity in the Czech Republic is significantly higher than in EU countries, partly because of relatively low energy efficiency, partly because the economy is still dominated by energy-intensive industries.

There are two main legislative acts of relevance for energy policy and energy efficiency policies. Energy Act No. 458/2000 Coll. provides the legislative framework for the energy supply industry, including the establishment and implementation of the Energy Regulatory Office. The Energy Management Act No. 406/2000 Coll. gives the framework for the development of a national energy policy as well as energy efficiency and renewable energy programmes.

## ENERGY EFFICIENCY POLICY

The Energy Management Act calls for the establishment of a National Programme for Energy Efficiency and the Use of Renewable Energy Sources, which was done in 2001. The programme runs for four years, allocating state funds for energy

saving measures, promoting cogeneration and modernisation of generation and distribution facilities, state-of-the-art technologies, renewable and secondary energy resources, as well as education, training, energy management, R&D and the preparation of territorial energy policies.

The Energy Management Act makes provision for:

- ✧ mandatory minimum efficiency levels in specific circumstances;
- ✧ energy labelling of appliances for residential use;
- ✧ defining when energy auditing is mandatory;
- ✧ state grants issued by the Ministry of Industry and Trade;
- ✧ monitoring activities of the Ministry of Industry and Trade and the State Energy Inspectorate; and
- ✧ levels of sanctions for violations of the Energy Management Act.

The Energy Management Act also obliges manufacturers, importers and distributors to introduce only energy consuming appliances onto the market that meet the minimum energy efficiency requirements as set forth in the applicable regulation. There is an obligation concerning efficient heating of buildings imposed on owners.

Energy efficiency programmes are divided amongst ministries according to the end-use sector addressed. The main ministries involved are the Ministries of Industry and Trade, Environment, Regional Development and Transport. The Czech Energy Agency implements programmes on behalf of the Ministry of Industry and Trade.

The overall budget for energy efficiency activities is difficult to estimate because the various measures include promotion of renewable energy. The annual state budget for energy efficiency and renewables administered by the Ministry of Industry and Trade has decreased from CZK 211 million in 1995 to CZK 102 million in 2003.

Some programmes cover all sectors. These include the PHARE revolving fund to finance energy efficiency investments and advisory services and regional energy agencies throughout the country. The Efficient Lighting Initiative (ELI) funded by the International Finance Corporation/Global Environmental Facility (IFC/GEF) has accelerated the penetration of energy-efficient lighting in all sectors.

Main programmes in the residential sector include minimum efficiency standards, energy labelling, energy auditing, subsidies (including two programmes specifically addressing the problems of panel buildings), information, education and training. In the commercial and public sectors there are subsidies,

information, training, energy audits and energy performance standards and labelling. Main programmes for industry include subsidy programmes, energy audits, and a range of information and training programmes. Transport programmes include information, education, subsidies for public transport, energy labelling of new passenger cars and the further electrification of the national rail system.

The Czech Republic has a climate change programme and is preparing for the Kyoto Protocol coming into force. It is encouraging the use of flexible mechanisms, as Joint Implementation, to promote foreign investment in projects to reduce Greenhouse gas (GHG) emissions, even though the Republic has no problem meeting its GHG emission reduction target.

## GENERAL ASSESSMENT

Since 1990, the Czech Republic has seen major changes in its energy system, moving from a planned approach to one that has largely been reformed, restructured and opened to competition. These reforms include electricity and gas sector unbundling, reformed prices, removal of subsidies and cross-subsidies, greater transparency and consumer protection. The fuel mix has changed, with a greater share of natural gas and nuclear electricity and a lower share of solid fuels. While the country is still highly dependent on imported energy, the higher nuclear share together with greater use of renewable energy and cogeneration and the establishment of a robust framework for energy efficiency improvements are contributing to reduced import dependence.

The Energy Act of 2000 together with subsequent new legislation provide a base for a well-functioning energy industry, protecting consumers and ensuring that consistent energy policy and energy efficiency policies and programmes be developed. The overall objectives of energy and energy efficiency policies are realistic.

One major concern is, however, that the national energy policy still gives a strong priority to energy supply, including renewable energy, and less priority to energy efficiency. Energy efficiency is not included in the Energy Act (while it is covered by the Energy Management Act) and the newly created Energy Regulatory Office has no role in promoting energy efficiency, unlike in several EU and other accession countries.

The Republic has undertaken extensive energy price reforms and most of the energy pricing issues were solved in 2002. It is important to continue monitoring prices to ensure that consumers are getting the correct pricing signals to motivate them to take energy efficiency actions and to make an energy choice that is sustainable in the longer term. For example, there is concern by some

market actors that the heat industry is being unfairly treated compared to other industries, particularly electricity.

The ecological tax reform, scheduled to be proposed to the government in 2004, is an important step aiming at internalising the environmental impacts into the energy prices.

The National Programme for energy efficiency combines a good mixture of mandatory measures (such as energy audits) with subsidies and information (including education, training and advice). Every effort needs to be given to ensure proper implementation. Given the range of programmes, the Czech Energy Agency, in particular, needs strong management support systems and good institutional capacity. This need will be even stronger after the Czech Republic has joined the EU.

One major concern is that the budget for energy efficiency provided by the government has declined significantly since the mid-1990s, while the need for energy efficiency measures and the emphasis on environmental issues have increased the importance of energy efficiency improvements. While renewable energy is important and there are indicative targets, the large electricity generation capacity surplus, which will last for years, will make it relatively costly to continue to favour renewable energy in electricity production. There is also an imbalance between the funding of energy efficiency and renewable energy, with energy efficiency receiving only a fraction (between one-seventh and one-tenth) of the funding of renewable energy.



# IN-DEPTH REVIEW OF ENERGY EFFICIENCY POLICIES AND PROGRAMMES OF THE CZECH REPUBLIC

## 1. INTRODUCTION TO THE PEEREA REVIEW

In September 2003, a team of representatives from the Working Group of the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects reviewed the energy efficiency policies and programmes of the Czech Republic.

The role of the in-depth energy efficiency review undertaken on a peer basis by the Working Group is to enhance the level of co-operation amongst contracting parties (Article 3.1 of the Protocol). The in-depth review is also used to assess progress, promote continuous dialogue and transfer information.

The Review Team, representing four Energy Charter Member States, consisted of Mr. Tadeusz Skoczowski of Poland, who chaired the review team, Mr. Peter Bach of Denmark, Ms. Isabel Blanco Alvarez of Spain and Mr. Irakli Shekrladze of Georgia. Professional support was provided by Mr. Tudor Constantinescu of the Energy Charter Secretariat and Mr. Rod Janssen, consultant to the Secretariat.

Organisations visited are shown in Annex 4 of this report.

The Review Team wishes to express its thanks to all Czech organisations and their representatives who participated in meetings during the review.

Special thanks go to officials of the Czech Energy Agency who undertook all the preparation of the mission, completing the PEEREA questionnaire and providing background papers and other information as requested.

The report is based on material provided by the Czech Republic as well as data and analyses from various other sources, including the International Energy Agency, the Third National Communication to the United Nations Framework Convention on Climate Change and other related materials. Statistical data presented are the most current data available.

## 2. OVERVIEW

The Czech Republic is a landlocked country that lies between Austria, Germany, Poland and Slovakia. It is slightly smaller in size than Austria and has a population of 10.3 million. The capital is Prague, which is also the largest city in the country. The Czech Republic became a separate country on 1 January

1993, having split from the former Czech and Slovak Federal Republic which itself broke from its communist past in 1989.

Figure 1: Map of the Czech Republic



The Czech Republic is a parliamentary democracy, with a President as head of state elected by Parliament. The country has a bicameral parliamentary system, consisting of the Senate (81 seats with members elected for six-year terms; one-third elected every two years) and the Chamber of Deputies (200 seats with members elected for four-year terms).

The Czech Republic is one of the transition economies joining the European Union in May 2004. In January 1996 the Czech Republic applied for EU membership. In December 1997 the country was invited to join the fast track to become a member of the European Union. It is also a member of the Energy Charter Treaty, the OECD, the IEA and NATO.

There are 14 administrative regions, which came into effect on 1 January 2000. Selected responsibilities were transferred from the central government to the self-governing regional councils. The former division into 77 Districts was replaced by 205 "Municipalities with Extended Authority."<sup>1</sup>

<sup>1</sup> See [www.czechinvest.org](http://www.czechinvest.org)

Figure 2: Regional Authorities of the Czech Republic



In 2002, the Czech economy grew at approximately 2.5% in real terms<sup>2</sup> and it is expected to grow at about 3% or more in 2003 and 2004. The OECD praises the Czech Republic for combining economic growth with price stability and falling unemployment. The country is also the leading transition economy in foreign direct investment (FDI) inflow and this has helped to modernise productive capacity. The government deficit was more than 7% of GDP in 2002 and it is expected to stay above 5% in the medium term according to the EBRD.

Even so, the OECD states that the Czech growth rate lags behind other countries in the region. This is considered to be the result of a combination of the rapid pace of "ineffective industrial investment in the first decade of transition," and "weak corporate governance and low subsequent exit of unprofitable firms." The highly productive industrial sector based on foreign investment is a major driver of the economy.

While still dependent on energy-intensive industry, the Czech economy is moving towards services. Services represented over 58% of GDP in 2002<sup>3</sup>, followed by over 36% for industry and 5% for agriculture. The main industries are metallurgy, machinery and equipment, motor vehicles, glass and armaments.

Trade is important and the main trading partners are the member states of the European Union. In 2001, exports went to: Germany (39%), Slovakia (8%), the United Kingdom (6%), Austria and Poland (5% each), France and Italy (4% each), and others (29%). The main exports from the Czech Republic in 2000 were machinery and transport equipment (44%), intermediate industrial products (25%), chemicals (7%), raw materials and fuel (7%). The main Czech

<sup>2</sup> OECD, *Economic Survey of the Czech Republic, 2003*, OECD Policy Brief, [www.oecd.org](http://www.oecd.org)

<sup>3</sup> *Economist Pocket World in Figures, 2003 Edition*

imports in 2000 were machinery and transport equipment (40%), intermediate industrial products (21%), raw materials and fuels (13%), and chemicals (11%).<sup>4</sup>

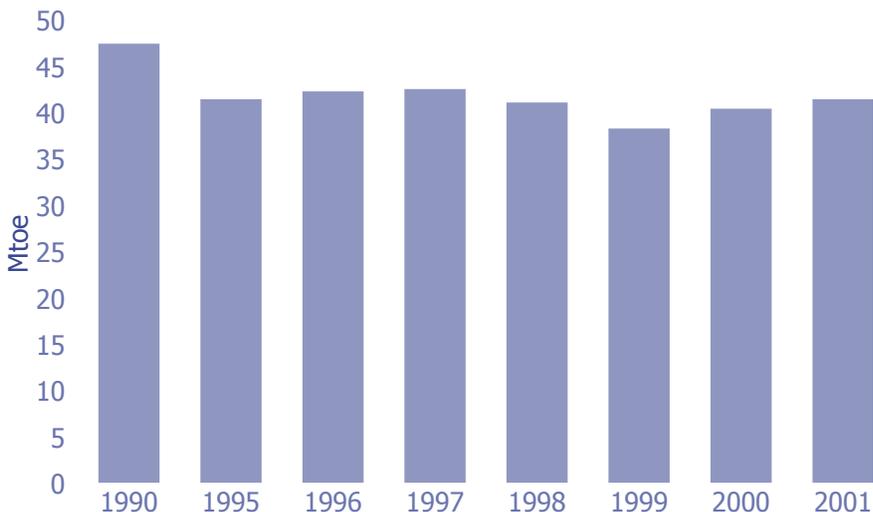
Given its location in Central Europe, the Czech Republic is important for the transit of natural gas, oil and electricity. It is also important for the transit of road freight.

The Czech Republic is highly dependent on the import of hydrocarbons (oil and gas). It has large reserves of coal, particularly lignite, but minimal reserves of oil and gas. Nuclear energy represents a high share of electricity generation, particularly since the opening of the Temelin nuclear plant in 2001. The country has a relatively little potential for renewable energy, with the small capacity in hydropower already exploited, poor wind resources but reasonably good biomass potential.

Coal represented 50.9% of Total Primary Energy Supply (TPES) in 2001, followed by oil at 20.3%, natural gas at 19.4%, nuclear at 9.3% and renewables at 2.1%.<sup>5</sup> Nuclear has a share of 40% of electricity production since the recent opening of the Temelin nuclear plant.

The evolution of TPES is shown in Figure 3.

Figure 3: TPES 1990-2001



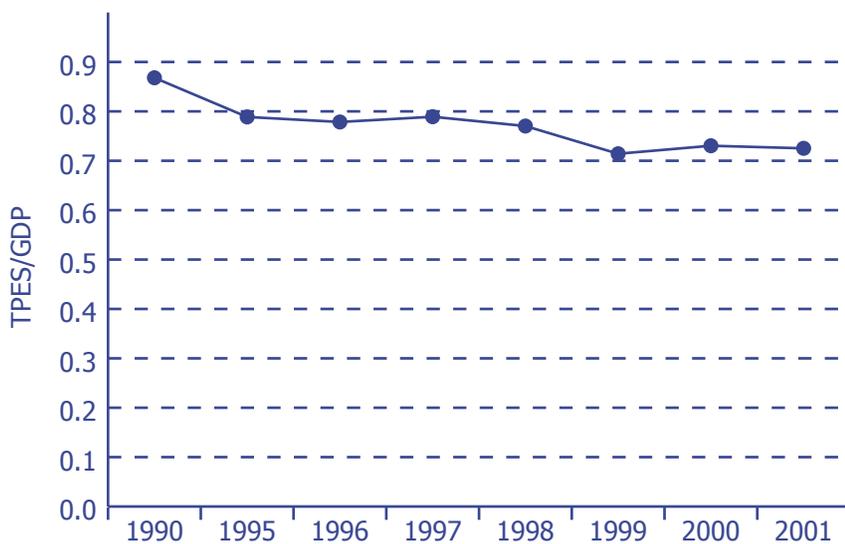
Source: IEA, *Energy Balances of OECD Countries, 2000-2001*, OECD, 2002

<sup>4</sup> See [www.cia.gov](http://www.cia.gov)

<sup>5</sup> IEA, *Energy Balances of OECD Countries, 2000-2001*, OECD, 2002

The following Figure shows the change in energy intensity between 1990 and 2001. It has decreased over the period, although there has been little change since 1999. Most of the change is probably due to restructuring in the economy, rather than to energy efficiency improvements.

Figure 4: Energy Intensity (TPES/GDP) 1990-2001



Source: IEA, *Energy Balances of OECD Countries, 2000-2001*, OECD, 2002

Energy policy has evolved since separation from the present Slovak Republic in 1993. Until the most recent national energy policy approved in 2000, energy policy was based on the 1994 Energy Act. Since the early 1990s, the transition to a market-based economy and energy system is well under way with most of the major reforms are in place or scheduled.

National energy policy is largely being driven by EU energy policies. EU policies that are particularly important include the directives on electricity and gas market liberalisation, the renewable energy directive and several directives on energy efficiency.

The preparation of national energy policy is the responsibility of the Ministry of Industry and Trade. Many ministries and government bodies are involved in both policy development and implementation, as shown in Section 8 below.

The energy supply industries have gone through extensive restructuring and privatisation. The gas and electricity sectors have been unbundled. An energy regulator has been established to promote "competition and protection of consumer interests in the areas of the energy sector in which competition

is not feasible, the purpose being to satisfy all reasonable requirements for energy supply".<sup>6</sup>

The electricity sector is dominated by ČEZ, a.s., the former national integrated electricity company, which is now the primary generator in the Czech Republic. ČEZ also has majority ownership in five of the eight regional distribution companies and minority ownership in the other three. The unbundling of the electricity industry includes a separate transmission grid operator, CEPS, a.s., and the electricity market operator, OTE, a.s.

As part of the liberalisation, the electricity market was opened to entities that consume more than 9 GWh per year as of 1 January 2003. This entails 350 eligible companies. The market is to be fully opened for competition by 2006.

The gas industry has been restructured and was privatised in 2002. Transgas is the main company for gas transmission and imports all gas into the country. It is 100% owned by RWE Gas of Germany. There are eight distribution companies, of which Transgas has a minority share in six. All imported natural gas comes from Russia and Norway.

The gas market is to be partly opened to competition on 1 January 2005 and reaching the level of 33% of total gas consumption by 10 August 2008.

Energy price reform has taken place and all subsidies and cross-subsidies were finally removed in 2002.

### 3. MAIN ENERGY POLICY HIGHLIGHTS

In January 2000 the Government approved the current national energy policy. The main focus of the policy was to set a long-term framework for energy sector development and to develop the necessary legislative and economic framework to encourage energy producers and distributors to act in an environmentally-friendly manner. For energy demand, the long-term objective is to reduce both energy intensity and raw material intensity and to get these intensities closer to the levels achieved in highly industrialised countries. Energy intensity in the Czech Republic is significantly higher than in EU countries, partly because the economy is still based on energy-intensive industries.

With accession to the EU imminent, Czech energy policy is closely aligning to EU requirements. Czech energy policy follows the same broad goals as the energy policy of the EU:

- ✧ security of energy supplies;
- ✧ ensure competitiveness of the economy; and

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<sup>6</sup> See [www.eru.cz](http://www.eru.cz)

- ✧ protection of the environment while respecting the principles of sustainable development.

The following basic objectives have been established in the 2000 National Energy Policy:

- ✧ greater use of local primary energy sources (to reduce dependence on energy imports) while maintaining an adequate level of domestic management of local energy sources and the relevant energy infrastructure;
- ✧ defining the public service obligations of utilities;
- ✧ achieving a harmony between the economic and social development and the protection of the environment in the Czech Republic;
- ✧ gradually securing the shared objectives and targets of the EU, including the application of specific legislation for the energy sector;
- ✧ extending the freedom for end users to choose their type of energy and their energy supplier, including energy related services; and
- ✧ creation of transparent and relatively stable market and legislative conditions for effective business management by the companies supplying energy and energy related services.

Energy efficiency is included in national energy policy, particularly related to improvements in energy intensity and the completion of price and tariff structure reform. The promotion of renewable energy sources and cogeneration is also included in the National Energy Policy.

There are two main legislative acts of relevance for energy policy and energy efficiency policies. Energy Act No. 458/2000 Coll. provides the legislative framework for the energy supply industry, including the establishment and implementation of the Energy Regulatory Office. The Energy Act supports the implementation of EU directives on the liberalisation of the electricity and natural gas industries. The main objectives of the Act are to:

- ✧ create a transparent business environment for the energy sector;
- ✧ define the functions, rights and obligations of the energy regulator; and
- ✧ develop competition in the electricity and natural gas markets.

The Energy Management Act No.406/2000 Coll. provides the framework for the development of a national energy policy as well as energy efficiency and renewable energy policy. The Act obliges the government to prepare the national energy policy, providing an outlook on energy policy for 20 years. The implementation of the National Energy Policy is assessed by the Ministry of Industry and Trade every two years and the results are reported to the

Government. Should the need arise, the Ministry shall propose changes to the National Energy Policy which are subject to government approval.

The Energy Management Act calls for the preparation of the National Programme for Energy Efficiency and the Use of Renewable and Secondary Energy Sources, which was prepared in 2001. The programme runs for four years, allocating state funds for energy saving measures, the development of cogeneration, modernisation of generation and distribution facilities, support for state-of-the-art technologies, materials for energy saving measures, promotion of renewable and secondary energy resources, education, training, consulting in energy management, science, R&D and the preparation of territorial energy policies. The objectives of the programme to the year 2005 are provided in the box below.

Objectives of the National Programme for Energy Efficiency and the Use of Renewable and Secondary Energy Resources to 2005:

- ✧ Increase in energy efficiency in all sectors of the national economy in order to improve the competitiveness of the Czech economy.
- ✧ Specific targets to 2005 for the increased use of renewable and secondary energy sources (see Section 6 below).
- ✧ Higher use of renewable energy sources as an alternative to fossil fuels in order to reduce the depletion of domestic fossil fuel deposits to keep them available for future generations.
- ✧ Advancement of research, development and the production of advanced technologies, materials and methods to support increased energy efficiency and the higher use of renewable energy sources in order to reduce future national energy consumption as well as to compete in world markets through the transfer of technologies and know-how.
- ✧ Raise awareness of the possibilities and contribution of measures for energy efficiency improvements and the wider use of renewable energy sources.
- ✧ Integrate EU priorities in the energy sector.
- ✧ Reduce the dependency of the Czech economy on the import of energy resources to reduce its vulnerability from the point of view of future increase of energy prices and possible future limited access of imported energy sources.
- ✧ Promote the mobilisation of additional public and private financial sources.
- ✧ Minimise the negative impacts of extraction and use of energy sources on the environment in accordance with the principle of sustainable development.

The current National Programme for Energy Efficiency and the Use of Renewable and Secondary Energy Sources has some other related quantitative targets:

- ✧ to reduce emissions by the year 2005:
  - ✦ SO<sub>2</sub> to 1.9 kg/1000 USD of GDP (1999: 2.0) or to 26 kg per inhabitant (1999: 26.6);
  - ✦ NO<sub>x</sub> to 35 kg per inhabitant (1999: 38.4).
- ✧ to reduce electricity intensity per unit of GDP.

The Energy Management Act makes provision for:

- ✧ mandatory minimum efficiency levels or maximum admissible energy losses for different facilities and energy use;
- ✧ promotion of cogeneration;
- ✧ energy labelling of household appliances;
- ✧ defining when energy auditing is mandatory;
- ✧ state grants issued by the Ministry of Industry and Trade;
- ✧ monitoring activities of the Ministry of Industry and Trade and the State Energy Inspection; and
- ✧ levels of sanctions which might be imposed by the State Energy Inspection for violations of obligations under the Energy Management Act.

The Energy Management Act states the obligation on manufacturers, importers or distributors to market only energy consuming appliances that meet the minimum energy efficiency requirements as set forth in the applicable regulation. Another obligation concerning efficient heating of buildings is imposed on owners.

The Energy Management Act also requires energy facilities or buildings to undergo an energy audit if a state subsidy within the National Programme is obtained. Energy audits are also obligatory under the Act if the facilities are owned by the state, regions or municipalities, or owned by natural or legal persons with total consumption higher than that stated in the relevant legal regulations. In the public sector, audits are obligatory if energy consumption is above 1,500 GJ per year. For private facilities, audits are mandatory if energy consumption is above 35,000 GJ per year.

Analysis undertaken in the Czech Republic shows that there is significant potential for energy efficiency improvements, as shown in Table 1.

Table 1: Energy savings potentials and cost assessment for their implementation (in the year 2005)

	Category	Measures				Total Savings	
		Non-investment savings (PJ)	Investment			(PJ)	%
			Savings (PJ)	costs (billion CZK)	specific costs (CZK/GJ)		
1	Technical potential	61.4	432.7	2,750.8	6,357	494.1	47.5
2	Economic potential: NPV (5 %) > 0		267.9	792.0	2,956	329.3	31.7
3	Economic potential: NPV (10 %) > 0		266.7	776.3	2,911	328.1	31.6
4	Market potential: simple payback <=6 years		103.5	84.3	814	164.9	15.9
5	Market potential: simple payback <=3 years		53.7	37.5	698	115.1	11.2

Source: *Analysis of the potential of energy savings and renewable sources of energy, SRC International CZ 2000*

The potential savings from no-cost measures represent about 6% of the total energy consumption, according to energy audits. The potential savings achievable with a subsidy ranging from 15% to 20% (difference between categories 2 and 4 in Table 1) are estimated at about 164.4 PJ with investment costs of CZK 707.7 billion\*. This means a minimum required subsidy of CZK 248 billion. Instead of direct subsidies, analysis shows that this potential could be achieved through non-interest loans from 30 to 100 %. The potential achievable saving without any subsidy, merely through business plans (category 5), is estimated at about 53.7 PJ with investment costs of CZK 37.5 billion or 700 CZK/GJ.

#### 4. ENERGY PRICING AND TAXATION

The 2000 national energy policy called for the final removal of subsidies and cross-subsidies in 2002 and that has effectively been achieved. Energy price reform has gradually taken place following the Act on Prices No. 526/1990 Coll. which came into effect in January 1991.

The Energy Regulatory Office has taken over responsibility from the Ministry of Finance for price setting. A decree from 2001 (ERO Decree No. 438/2001 Coll.) specifies the price regulation for electricity, gas and district heating. For electricity, prices are to be transparent in order to eliminate cross-subsidies and there is a need to protect final customers where competition is not feasible. The approaches to price regulation for each of the activities in the electricity

\* 1 Euro = 32.3 CZK, September 2003

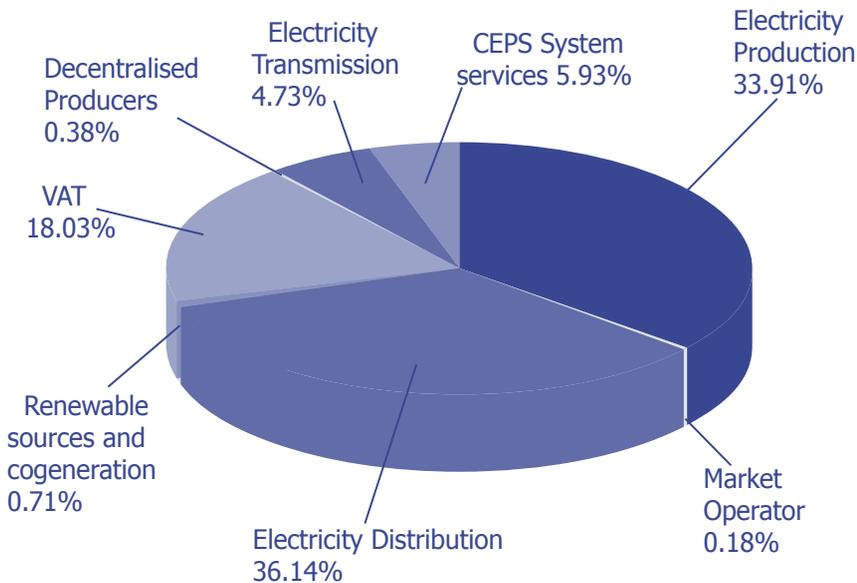
industry (e.g. transmission and distribution) are included. There have been no cross subsidies in electricity and gas prices since 2002.

Natural gas prices now trace all cost items (e.g. imported gas and the currency exchange rate). Changes in natural gas supply price are made systematically. The commodity price can be changed quarterly (according to price changes for crude oil and natural gas on international markets) and the distribution price is changed annually.

There is a requirement for unbundling accounts of heat generation and distribution. The decree states that in the first regulatory period<sup>7</sup>, cost-based prices and limits on heat prices to households apply. The profit margin is to be regulated in the second regulatory period.

End-use energy prices are shown in Annex 3.

Figure 5: 2003 Household final electricity price analysis



Source: Energy Regulatory Office

<sup>7</sup> According to ERO Decree No. 438/2001 Coll., the first regulatory period runs from 1 January 2002 to 31 December 2004

## TAXES AND LEVIES

There is a range of taxes and levies in the Czech Republic. At this point there are no hydrocarbon taxes, but the Ministry of Environment is preparing proposals for environmental taxes. This proposal is scheduled for 2004.

All fuels are subject to VAT at a rate of 22% except for heat from district heating and biofuel, which have a reduced rate of 5%. Excise taxes were introduced in 1992. There is a levy on nuclear electricity for the funding of nuclear waste management and future plant decommissioning.

The Clean Air Act includes emission standards for individual installations with a capacity above 0.2 MW. The emission taxes are as follows:

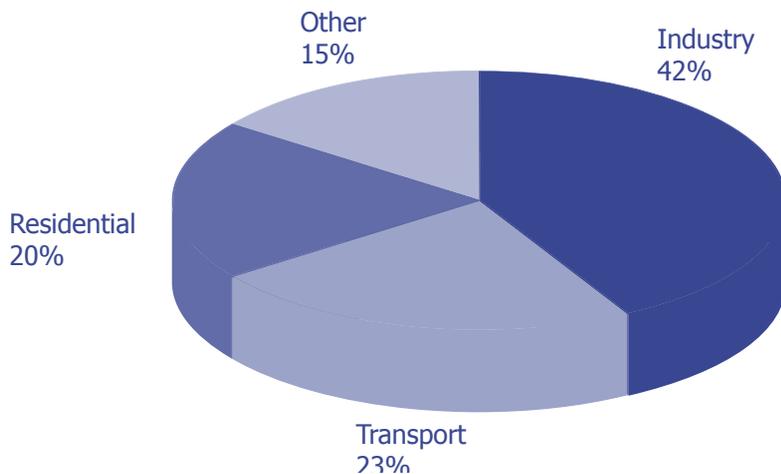
Pollutant	Emission tax (CZK/tonne)
SO <sub>2</sub>	1,000
NO <sub>x</sub>	800
Particulates/solid substances	3,000
CO	600
Hydrocarbons	2,000

There is tax relief on the income from small hydro plants (with output up to 1 MW), wind power, heat pumps, solar facilities, bio-gas and wood-gas production and energy utilisation, and power plants using biomass. Building owners using renewables for heating can have the real estate tax cancelled for five years. Owners of facilities for solar, wind, geothermal, biomass, biogas and small hydro are exempted from real estate tax and real estate transfer tax.

## 5. END-USE SECTORS

Figure 6 shows the distribution of energy consumption by end-use sectors. Industry is the largest sector in terms of energy consumption (42%) and its share is significantly higher than the average in the European Union (about 30%).

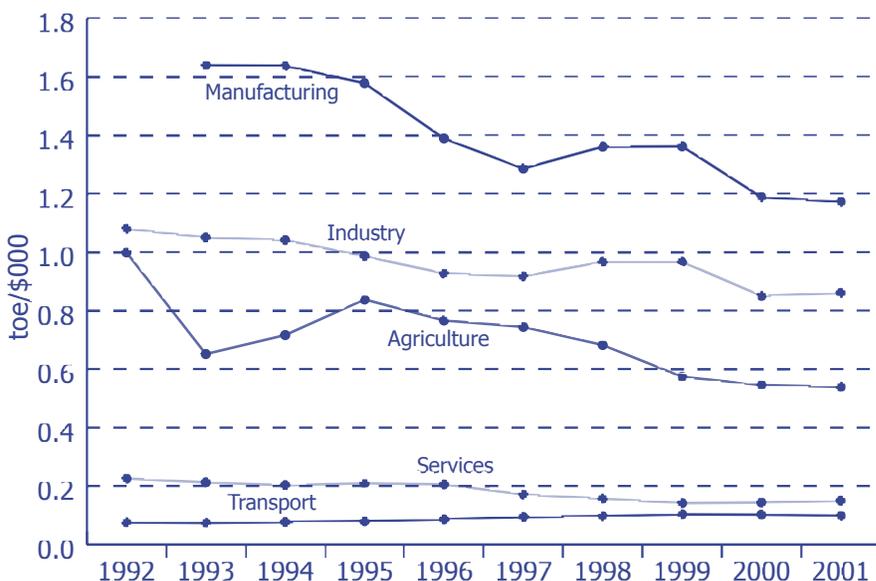
Figure 6: Structure of Final Energy Consumption by End-use Sector in 2001



Source: IEA

Figure 7 compares the energy intensities in the various end-use sectors. There have been improvements in energy intensity in all sectors, although not in transport. Further analysis is needed to determine the extent to which the changes are due to energy efficiency improvements or structural changes.

Figure 7: Sectoral Energy Intensities



Source: CEA

## INDUSTRY

In 2001, the industrial sector contributed almost 37% to the GDP of the Czech Republic.<sup>8</sup> Of that 37%, manufacturing accounted for 29%.<sup>9</sup> Almost 33% of the workforce in 2001 was employed in industry.<sup>10</sup> The manufacturing sector has proven to be quite resilient. During the recession of 1996-1999, when GDP dropped by 4% in constant prices, manufacturing production increased by 12%. By 2001, manufacturing production was 32% higher than in 1996. Between 1997 and 2001, exports increased by about 82%.

The car industry, metallurgy and metal products, electrical and optical equipment, food and tobacco dominate the sector. In terms of energy consumption, the largest industrial sectors are iron and steel production and chemicals and petrochemicals, as shown in Annex 2. In total there are about 7,000 companies in the sector. Two-thirds of the companies have less than 100 employees. Those

<sup>8</sup> *The Economist, Pocket World in Figures, 2003 Edition, London 2002*

<sup>9</sup> *Ministry of Industry and Trade, Panorama of the Czech Industry 2001, Prague, 2002, p. 15*

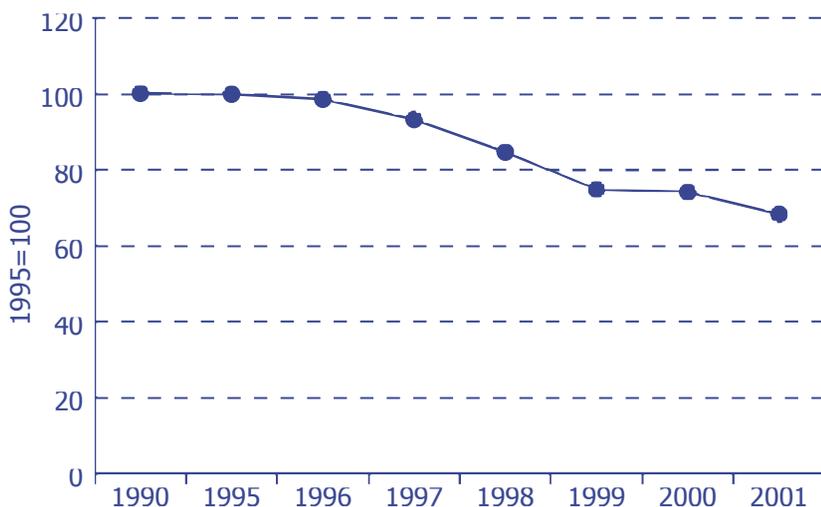
<sup>10</sup> *EBRD, Transition Report, 2002, London 2002*

companies with more than 2,000 employees consume about 80% of the energy in the industrial sector.<sup>11</sup>

Heat was the dominant energy source in industry in 2000 at 30.6% of TFC, followed by natural gas at 25.6 %, electricity at 15.6 %, coal at 15.4 % and petroleum products at 9.9%, see Annex 2.

The following Figure shows the evolution of industrial energy intensity between 1990 and 2001.

Figure 8: Industrial Energy Intensity



Source: IEA

## RESIDENTIAL SECTOR

The residential sector is the second largest end-use sector in the Czech Republic. In 2001 the housing stock was 4.3 million units, a 6.5% increase from 1991. There are 418 dwellings per 1,000 inhabitants.

<sup>11</sup> SRC International CS s.r.o et al., *Energy Efficiency Action Plan, Policy Action Plan for Promotion of the End-use Energy Efficiency in the Czech Republic to 2010, Prepared for the World Bank, the Ministry of Industry and Trade and the Ministry of Environment of the Czech Republic, August 1999, p.18*

The housing stock is divided into private rental, municipal rental, co-operative and privately owned. In 2001, the shares of each were<sup>12</sup> :

Housing Stock	Percentage
Private Rental	7%
Municipal Rental	24%
Co-operative Rental	20%
Owner-occupied	49%

About one-third of apartments are in pre-fabricated panel buildings. These buildings are in poor condition and do not comply with recent regulations. The cost of repair and modernisation is high and the government has had to take an active role as will be shown in the section on programmes below. One of the problems for policy is that a high percentage of this housing is in "structurally impaired regions and economically weak districts."<sup>13</sup> In one region, 90% of the population live in such buildings. There has been a long-term neglect of maintenance and many buildings have serious structural defects, high operating costs, reduced safety and a rising risk of deteriorating standard of living.

There are approximately 32,000 new houses built annually. The highest point was in 1998 when over 35,000 houses were started.

Energy represents a high share of housing-related expenditures as shown by the following Table:

Table 2: Percentage of Individual Types of Housing-Related Expenditures in the Total

	Average household	Household of employed persons	Household of retirees
Rent	20.8%	21.5%	22.1%
Regular maintenance	8.9%	9.3%	7.7%
Water supply and other services	11.4%	11.9%	9.8%
Energy	58.9%	57.5%	60.4%

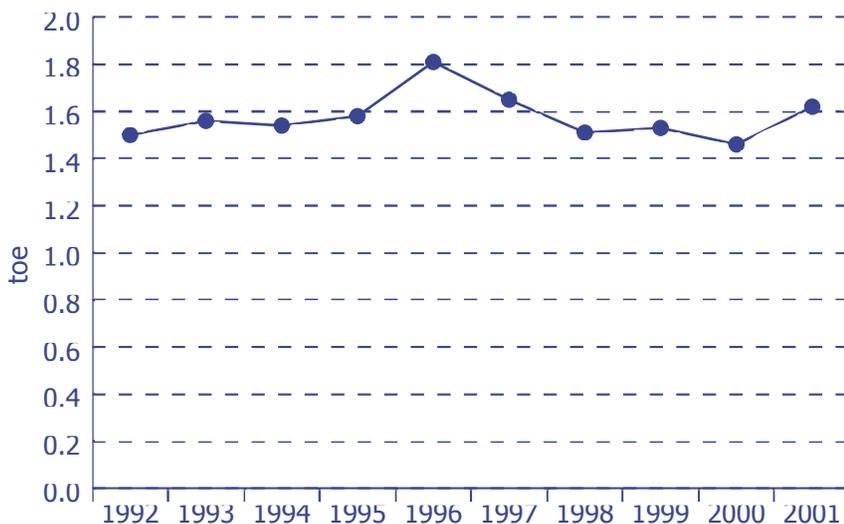
Source: Czech Statistical Office

<sup>12</sup> Ministry for Regional Development, *Housing Policy Concept (Updated version of the Housing Policy Concept dated October 1999)*, Prague, November 2001

<sup>13</sup> Material provided by Ministry for Regional Development of the Czech Republic, 2003

The following Figure shows the unit consumption per dwelling for thermal uses.

Figure 9: Unit Consumption Per Dwelling for Thermal Uses



Source: CEA

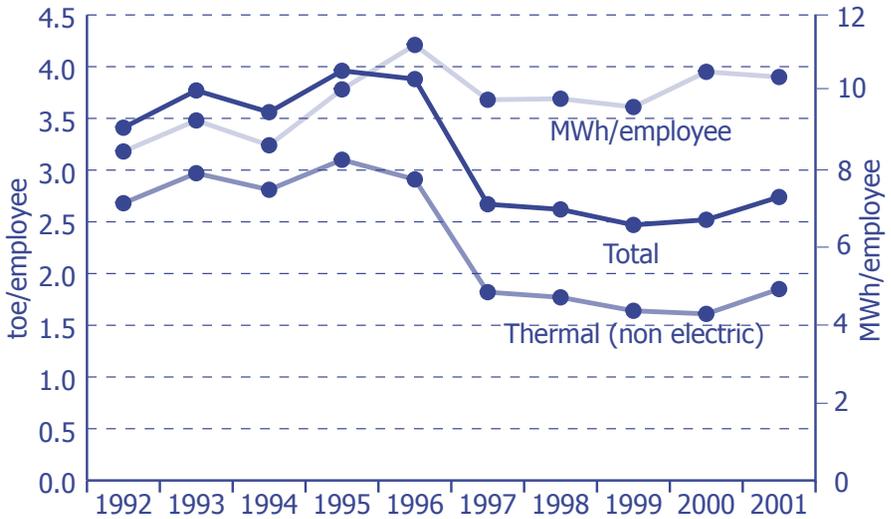
Almost 1.5 million households are connected to district heating. This represents about 35% of the total. Natural gas, coal and biomass account for most of the rest of the heating.

## COMMERCIAL/SERVICES

The tertiary sector is growing in importance. Services represent over 58% of GDP and employ about 55% of the workforce.<sup>14</sup> Services is the third largest end-use sector in terms of energy consumption. Figure 10 shows that unit consumption per employee has generally declined, although it has recently started to increase.

<sup>14</sup> *The Economist, Pocket World in Figures, 2003 edition. London 2002*

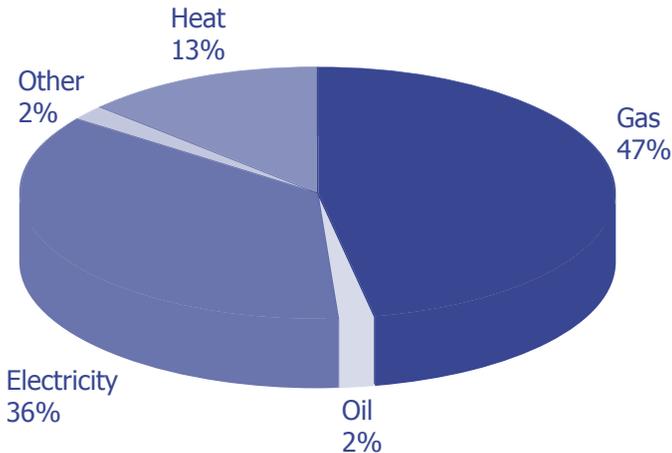
Figure 10: Unit Consumption Per Employee in the Service Sector



Source: CEA

The following Figure shows energy consumption in the sector by fuel type.

Figure 11: Energy Consumption in the Commercial/Services Sector



Source: IEA and CEA (see Annex 2)

In the services sector, the largest consuming sub-sectors are education, healthcare and government administrative buildings.

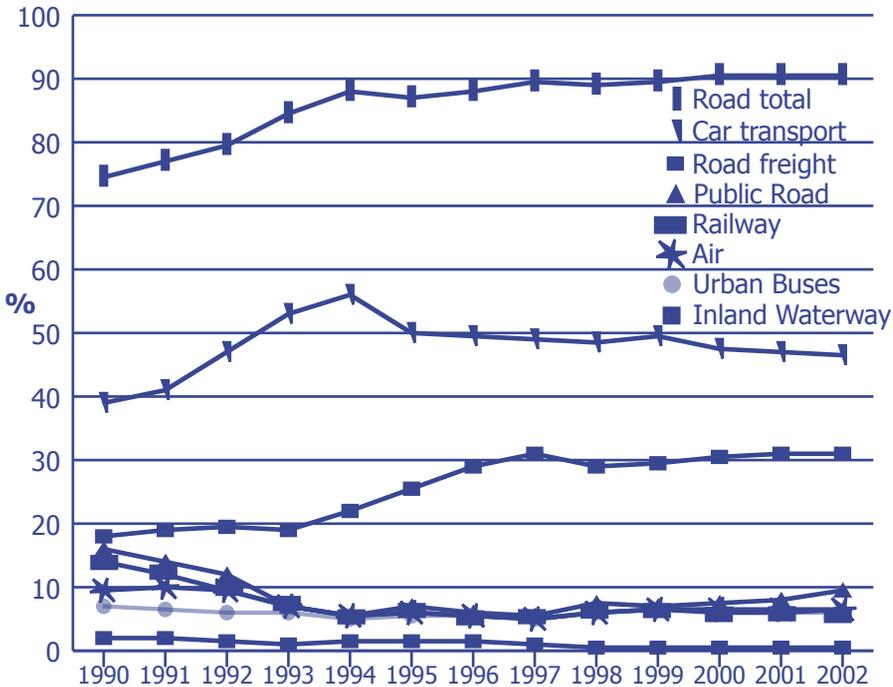
## TRANSPORT

The Czech Republic has a well-developed transport system and it is a major European transit route, given its location. There are 499 km of motorway with a further 304 km of expressways. In 2001, there were over 9,000 km of railways of which 1,878 km were lines with two or more tracks and 2,893 km were electrified. There are ten airports licensed for international flights. There is internal shipping along the many rivers.

The Czech Republic had 362 cars per 1,000 inhabitants in 2000, an increase from 320 in 1998. In 2001, there were just over 3.5 million cars, of which just over 2 million were more than 10 years old.

For the sector as a whole, energy consumption has increased at a rate of 7.3% per year between 1990 and 2000. Most of the consumption is petroleum products, although railways are increasingly becoming electrified.

Figure 12: Structure of Transport Energy Consumption



Source: Ministry of Transport

## 6. COMBINED HEAT AND POWER (CHP), DISTRICT HEATING (DH) AND RENEWABLE ENERGY

District heating is important in the Czech Republic as it is for all transition economies in Central and Eastern Europe. District heating has a 35% share of the heat market in the residential sector. However, most heat is used in the industrial sector. The services sector is a distant third.

District heating companies have been privatised, with their share capital owned by foreign investors or the State, (including the electric utility ČEZ) or by municipalities themselves.

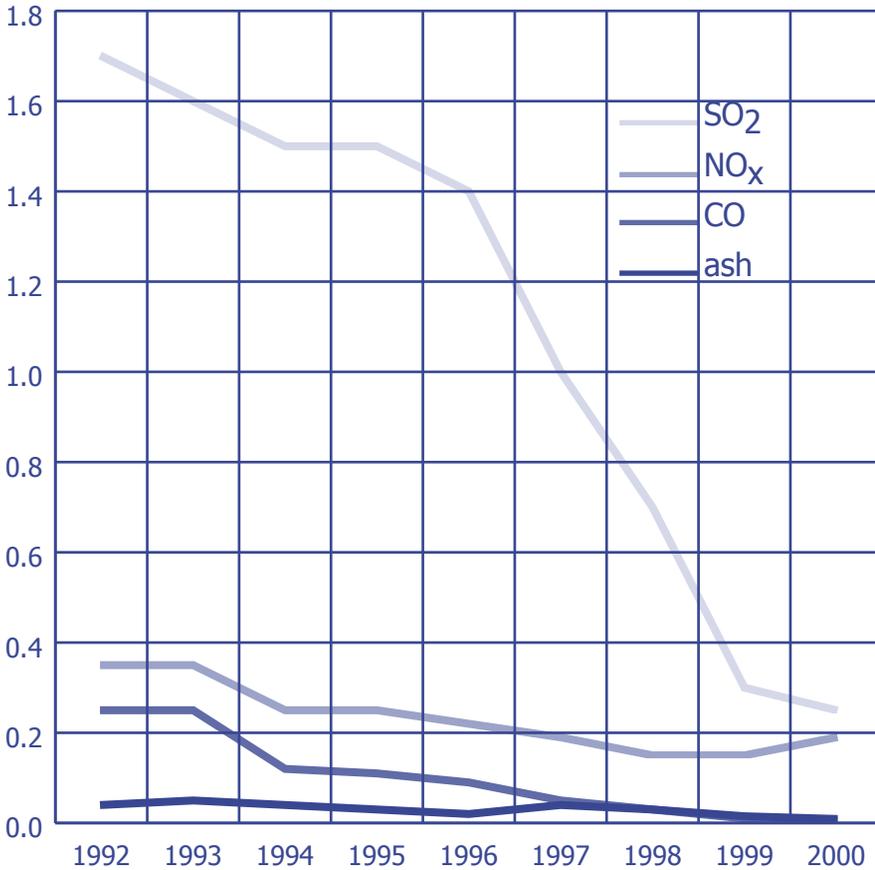
In the 1990s, there was significant investment to improve the state of the district heating systems. While more capital is needed, the Association for District Heating believes that most of the investment has taken place. There are still plans to invest in pre-insulated pipes. Heat metering for buildings is obligatory under Energy Act 458.

In 1999, about 34% of heat was produced from central sources. About 9% of electricity comes from combined heat and power systems.

The heating sector is under market pressure from natural gas used for individual boilers. New buildings have the choice of heating method. District heating is still gaining market share in high density urban areas. The district heating association believes that there is unfair competition through underpricing from the electricity industry, even though it appreciates that cross-subsidies in natural gas and electricity have been removed. There is concern that the tariff structure unfairly penalises district heating.

Figure 13 shows the reduction of emissions in district heating companies that are members of the Association for District Heating.

Figure 13: Evolution of Emissions by Member Companies of the Association of District Heating of the Czech Republic of GJ heat (kg/GJ)



Source: Association for District Heating of the Czech Republic

The National Energy Policy is actively promoting cogeneration. The Act includes an obligation on electricity transmission and distribution companies to purchase electricity from CHP, although the prices are negotiated. There is also a separate obligation to purchase heat from industrial processes and renewable energy sources.

## RENEWABLE ENERGY

Table 3 shows the current utilisation of renewable energy resources in the Czech Republic in 2000.

Table 3: Current utilisation of renewable sources of energy (2000)

Type of renewable and secondary sources of energy	Electricity		Heat	Total
	MWh Produced	TJ Consumed	TJ	TJ
Wind	5,000	18	0	18
Hydro	680,000	2,448	0	2,448
Big hydro power plants	1,573,000	5,663	0	5,664
Solar Heating systems	0	0	356	356
Photovoltaic systems	30	0	0	0
Geothermal energy	0	0	105	105,00
Biomass	30,000	108	21,000	21,108
Waste	2,500	9	967	967
Ethanol/Bio-diesel fuel	0	0	2,261	2,261
Total	2,290,530	8,246	24,689	32,935

Source: Ministry of the Environment, Czech Environmental Institute

The overall objectives for renewable energy were shown above in Section 3. Unlike for general energy efficiency, there are specific quantitative targets for renewable energy. There is a target to increase the share of renewables in TPES from 3 to 6% by the year 2010. The targets in the current National Programme for Energy Efficiency and Renewable and Secondary Energy Sources for the year 2005 are:

- ✧ production of electricity from renewable sources to the amount of 3% of total electricity consumption (without hydropower station with capacity above 10 MW) or 5.1% (including the hydropower stations above 10 MW); and
- ✧ share of renewable energy sources in the total primary energy consumption at the level of 2.9% (without hydropower stations with capacity above 10 MW) or 3.2% (including hydropower stations above 10 MW).

Renewable energy is important in the policy framework of the Czech Republic. There are several reasons: Firstly, the interest in self-sufficiency, since the country is highly dependent on imported energy. Secondly, renewables will contribute to lower GHG emissions. Thirdly, it is important because of the country's accession to the European Union. According to the EU Directive on

Renewable Energy (Directive 2001/77/EC) Member States are required to reach an indicative target for the share of renewable energy in electricity production by 2010.

Renewable energy is being promoted for electricity production, heat and transport fuels. There are many programmes to support renewable energy development, including several of the subsidy programmes described below for energy efficiency. The State Environment Fund (see Section 9) supports renewable energy technologies.

The potential for renewables appears to be low compared to many EU Member States.

## 7. ENERGY EFFICIENCY POLICIES AND PROGRAMMES

The energy efficiency programme is stated in the National Programme for Energy Efficiency and the Utilisation of Renewable and Secondary Sources of Energy. The programme runs for four years, with an assessment every two years. The current programme continues until 2005.

To achieve the national energy efficiency objectives described above, the government has established the following priority activities:

- ✧ increase the general knowledge of the population about options and benefits from the implementation of measures leading to increased effectiveness of energy use;
- ✧ direct state subsidies for the implementation of measures leading to the increased efficiency of energy use in all end-use sectors;
- ✧ support for research, development and the deployment of energy efficient technologies;
- ✧ support for the introduction of financial instruments for measures leading to energy savings;
- ✧ support for the introduction of energy management at all relevant levels: for regions, towns and local authorities as well as companies and institutions;
- ✧ support for international co-operation, transfer of technologies and know-how, participation in international programmes and projects mainly in the framework of the EU, for the increased effectiveness of energy use and higher utilisation of renewable energy sources; and
- ✧ progressive introduction of a fiscal system supporting energy-efficient and environmentally-friendly technologies.

There are a variety of policy instruments. These include energy price liberalisation to remove cross-subsidisation (which has already been implemented), direct subsidies, proposed fiscal reform (see Section 9 below), tax relief for energy efficient technologies, a revolving fund, standards and regulations for minimum efficiency levels and for labelling, voluntary activities and information, training and promotion.

Programmes are divided amongst ministries according to the end-use sector addressed. The main ministries involved are Industry and Trade, Environment, Regional Development and the Ministry of Transport.<sup>15</sup> The Czech Energy Agency implements programmes – from Programme A - on behalf of the Ministry of Industry and Trade.

The overall budget for energy efficiency activities is difficult to estimate because the various measures include promotion of renewable energy. The implementation costs are shown in Table 4.

Table 4: Budget of the Czech Energy Agency, Other Public Bodies and Private Sources, to Promote Energy Efficiency 1995-2003, million CZK

	1995	1996	1997	1998	1999	2000	2001	2002	2003
State Budget	211.0	229.9	362.6	341.9	315.0	209.0	102.2	92.5	102.0
Other public resources	185.0	220.0	243.0	213.0	205.0	150.0	120.0	n.a	n.a
Privately financed measures	488.2	492.6	672.0	1482.0	2144.0	977.0	534.0	n.a	n.a

Source: Czech Energy Agency, quoted in *The Czech Republic's Third National Communication on the UN Framework Convention on Climate Change, 2001*, p. 49 and direct communications with CEA on 2002

## CROSS SECTOR MEASURES

In 1997, the EU-funded PHARE Energy Savings Fund (ESF) was created to support energy efficiency projects in the areas of monitoring and regulation of heating systems, double-glazing of windows, reduction of heat losses through walls and roofs, improvements in lighting, etc. The initial funds amounted to €4.5 million. The fund is managed by the bank, CSOB, a.s. CSOB a.s. has funds for ten years to extend loans at preferential rates for small and medium-sized

<sup>15</sup> Programmes are divided amongst Ministries as Programme, A, B, C and so on. For example, Programme A is the programme implemented by the Ministry of Industry and Trade. Programme B is the programme implemented by the Ministry of Environment, with Programme C implemented by the Ministry of Agriculture

energy savings investments. The bank uses its own funds on a 67/33 (former 50/50) co-financing basis with PHARE. At least 40% of the energy savings must be achieved through reduced energy consumption. The loan repayment period varies between four and ten years. Since the beginning of the implementation of the PHARE ESF, the Bank has granted 45 credits with a total amount of almost CZK 400 million , i.e. about CZK 200 million from the PHARE ESF.

The Czech Republic participated in the SAVE programme of the European Union between 1998 and 2002.

The Government supports energy consulting and information centres and regional energy agencies (KEA). Advisory services are free to the public in order to improve public information. The advisory services have formed a network of Energy Advisory and Information Centres (EKIS) and Municipal Advisory Centres (MEPS). Each centre has to have a minimum of three advisors. The subsidies are for advisory services and not for technical equipment. The Regional Energy Agencies are discussed below in Section 8.

The Government provides subsidies for educational activities. These can include non-profit expert courses, seminars and conferences.

The Efficient Lighting Initiative (ELI) is a three-year programme headed by the International Finance Corporation (IFC) of the World Bank Group and funded by the Global Environment Facility (GEF). ELI's goal is to reduce GHG emissions by accelerating the penetration of energy efficient lighting technologies in emerging markets. ELI operates in the Czech Republic as well as in six other developing or transitional countries. The ELI budget for the Czech Republic is \$1.25 million. The project in the Czech Republic is managed by the non-profit company, SEVEN.

ELI is in the Czech Republic promoting energy-efficient streetlighting, and compact fluorescent lights (CFLs) in households, undertaking lighting design contests, encouraging the use of lighting ESCOs, promoting technology procurement and undertaking education and information activities. Several lighting companies are participating in ELI through co-ordinated advertising. Utilities and consumer groups are also participating.

The project terminated at the end of 2003. There are some tangible results demonstrated by an increase in sales of CFLs, of which sales have increased between 20 and 30% since 2001.

## RESIDENTIAL/COMMERCIAL

There are a number of programmes in these sectors.

In terms of mandatory or regulatory programmes, there is the full range of EU directives, primarily on energy efficient appliances and energy labelling, as shown in the following box. The most recent directive concerns energy performance of buildings which is currently in the implementation phase for all EU member states and accession countries. It has to be fully implemented by January 2006.

The Czech Republic has building standards that are not mandatory unless government money is invested. The thermal efficiency standards were most recently revised in 1994. The thermal insulation is stipulated by the Energy Management Act and its decree No. 291/2001 Coll. Under the new EU directive on energy performance in buildings, the building standards will have to be revised.

There are energy labels for new buildings and modernisation of existing buildings, as required under EU Council Directive 93/76/EEC. It is obligatory in accordance with Regulation No. 137/1998 Coll. There is an energy "passport" defined by Regulation No. 291/2001 Coll. It is part of the project documentation for the building permit procedure. The "passport" includes relevant data on thermal quality for new buildings and for modernised buildings. The energy "passport" is not part of the Government programme.

Legislative measures related to energy efficiency in the residential sector been adopted by the European Union since 1992 and to be implemented by the Czech Republic:

- ✧ Council Directive 92/42/EEC on "efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels."
- ✧ Council Directive 92/75/EEC on "the indication by labelling and standard product information on the consumption of energy and other resources by household appliances."
- ✧ Council Directive 93/76/EEC on "to limit carbon dioxide emissions by improving energy efficiency (SAVE)."
- ✧ Commission Directive 94/2/EEC implementing Council Directive 92/75/EEC "with regard to energy labelling of domestic electric refrigerators, freezers and their combinations."
- ✧ Commission Directive 95/12/EC implementing Council Directive 92/75/EEC concerning energy labelling of clothes washers.
- ✧ Commission Directive 95/13/EC implementing Council Directive 92/75/EEC concerning energy labelling of clothes dryers.
- ✧ Council Directive 96/57/EC on energy efficiency requirements for household electric refrigerators, freezers and combinations thereof.
- ✧ Commission Directive 96/6/EC implementing Council Directive 92/75/EEC concerning energy labelling of household dishwashers.
- ✧ Commission Directive 97/17/EC of 16 April 1997 implementing Council Directive 92/75/EEC with regard to energy labelling of household dishwashers
- ✧ Commission Directive 98/11/EC implementing Council Directive 92/75/EEC concerning energy labelling of household lamps
- ✧ Directive 2000/55/EC of the European Parliament and of the Council of 18 September 2000 on energy efficiency requirements for ballasts for fluorescent lighting.
- ✧ Commission Directive 2002/31/EC of 22 March 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household air-conditioners.
- ✧ Commission Directive 2002/40/EC of 8 May 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric ovens.
- ✧ Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings.

From the EU Directive on Energy Performance of Buildings (Directive 2002/91/EC)

From Article 1: This Directive lays down requirements as regards:

- ✧ the general framework for a methodology of calculation of the integrated energy performance of buildings;
- ✧ the application of minimum requirements on the energy performance of new buildings;
- ✧ the application of minimum requirements on the energy performance of large existing buildings that are subject to major renovation;
- ✧ energy certification of buildings; and
- ✧ regular inspection of boilers and of air-conditioning systems in buildings and in addition an assessment of the heating installation in which the boilers are more than 15 years old.

There are subsidies for specific projects, tax relief for specific technologies, energy auditing, optimisation concepts of housing estate complexes, consultation, education and training. Advice is provided directly through the CEA and through the regional energy agencies and local advisory centres.

Subsidies can be for energy audits for buildings, for modernisation of energy supply systems in housing estates, and for the installation of cogeneration. For example, energy audits can obtain a subsidy of 30% of the cost up to a maximum of CZK 500,000 and modernisation projects can receive a subsidy of 15% of total investment costs up to a maximum of CZK 3 million. Pilot projects using advanced technologies can receive up to CZK 3 million. Energy centres can receive a maximum of CZK 120,000 a year and Regional Energy Agencies can receive a maximum of CZK 500,000, covering 40% of eligible expenses.

The Ministry of Regional Development has different programmes for prefabricated panel buildings which, as mentioned above, represent one of the major housing problems in the country. One programme is for repairs of blocks of flats built with prefabricated concrete slab technology. There is a 40 % direct non-recoverable purpose-tied subsidy. The objective of the programme is to eliminate emergency defects of prefabricated panel buildings. This programme is targeted to all owners of such buildings: municipalities, housing co-operatives, private individuals and legal entities. Since it is designed for emergency work, it is to complement other programmes.

The State Housing Development Fund manages the second programme – the so-called "Panel" Programme. The Fund provides a reduction of the interest

on loans by 3%. It provides subsidies for repair and modernisation of panel buildings. The purpose of the repairs is to:

- ✧ Extend the useful life of existing buildings by no less than 30 years.
- ✧ Reduce energy intensity.
- ✧ Increase the standard of living.

The State Housing Development Fund is designed to complement programmes of the Ministry of Regional Development. The Fund is an independent organisation created in 2000. Its function is to help the construction of housing, particularly rental housing; repair housing stock and support the construction of technical infrastructure in municipalities aimed at creating suitable conditions for future construction of housing. Income for the Fund, which is outside the state budget, comes from the National Property Fund and from the state budget as well as the EU and other donations.

The PHARE Revolving Fund, described above, can be used in this sector.

## INDUSTRY

There are various forms of financial support, including the PHARE Revolving Fund described above. There are subsidies for energy audits for companies that have a total energy consumption greater than 15,000 GJ per year. The subsidy can be for 30% of total project costs. There are separate subsidies for the installation or refurbishment of boiler plants in combination with cogeneration units, pilot projects, energy management systems, low-cost measures in industrial enterprises and projects leading to the reduction of GHG emissions.

Energy auditing is mandatory for companies consuming above 35,000 GJ per year.

There are relevant EU directives on boiler efficiency and energy performance of buildings, in particular.

There are voluntary agreements between the Ministry of Environment and the Confederation of Industry of the Czech Republic and between the CEA and the Czech Association of Energy Sector Employers (CSZE), the Chamber of Commerce of the Czech Republic and others to co-operate in reducing energy demand and to encourage higher utilisation of renewable and secondary sources of energy.

There is energy labelling of industrial buildings (see above under residential sector) and this will be expanded once the EU Directive on Energy Performance of Buildings is fully implemented.

Industry can take advantage of consultancy and education/training support as described above.

Recently the IFC announced a new energy savings programme in Central and Eastern Europe, including the Czech Republic, for businesses. The programme includes a bank loan with up to a 50% guarantee from the programme. The Czech bank, Ceska Sporitelna, is the first bank in the region and the country to join the project. It can get a loan of up to CZK 150 million, with a repayment period of seven years and an interest rate of 3%. The bank has announced a new product, FINESA (Financing of Energy Saving Applications), which offers investment credit with an IFC guarantee to a value not exceeding 50% of the credit for energy savings projects.

## PUBLIC SECTOR

There is direct support for projects under Programme A of the National Programme. This includes various types of energy efficient equipment, energy audits, pilot projects, rehabilitation of district heating systems, the installation of production and distribution of energy (e.g. cogeneration).

There is mandatory energy auditing for energy management and buildings with an energy consumption at a single location exceeding 1,500 GJ per year.

The public sector can take advantage of consultancy and education/training support as described above.

There is a requirement for the preparation of territorial energy concepts. Municipalities are obliged to complete them within a certain deadline and there is a decree outlining the requirements of such concepts. There is financial support from the Ministry of Industry and Trade for the preparation of the energy concepts.

## TRANSPORT

There is a wide range of energy efficiency-related activities in transport from information, education and consultancy to the promotion of public transport and the promotion of the use of biofuels. The Ministries of Transport and Agriculture are working together to promote biofuels. At present about 35% of the rail network is electrified. The Government is supporting the further electrification of the national rail system. There is support for energy management systems in transport companies. There is consideration for integrated transport systems and the development of combined transport modes.

There are subsidies for public transport from municipalities, up to 60% since tickets represent about 30% of costs.

The Czech Government is committed to fulfilling its obligations with the EU, including energy labelling of new passenger cars.

## 8. ORGANISATION OF ENERGY EFFICIENCY ACTIVITIES

Energy efficiency activities are undertaken by many organisations, both within and outside government. Preparation of energy efficiency policy is the responsibility of the Ministry of Industry and Trade which it submits to the Government for approval. Implementation of energy policy in the field of energy efficiency and renewable energy sources is undertaken through the Czech Energy Agency.

Figures 14.A and 14.B shows the organisation chart of the Ministry of Industry and Trade, valid as of 1 January 2004. It is the Department of Energy Savings and Support of Renewable Energy Sources under the Energy Section which is responsible for energy efficiency and renewable energy sources. The energy policy is in the responsibility of the Department of Raw Materials and Energy Policies (until December 2003 the Energy Policy Department) under the Conception Section. The Energy Section and the Conception Section are subordinate to a Deputy Minister, who co-ordinates their activities.

Figure 14.A: Organisation Chart of Ministry of Industry and Trade, Energy Section (valid as of January 2004)

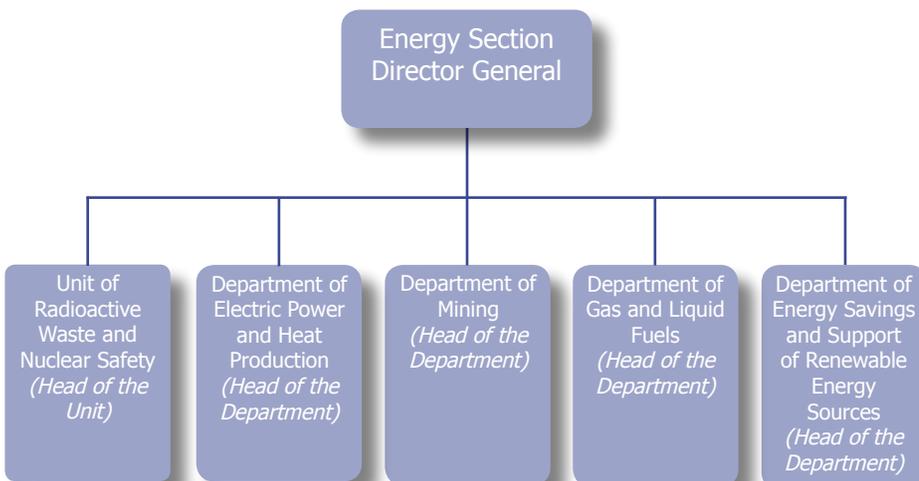
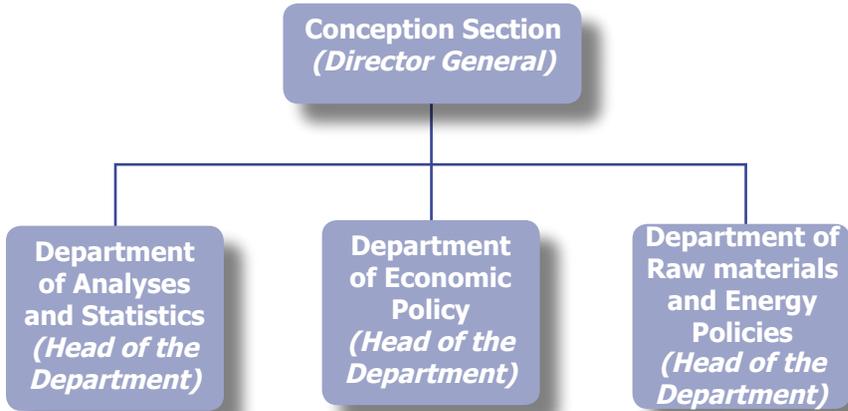


Figure 14.B: Organisation Chart of Ministry of Industry and Trade, Conception Section (valid as of January 2004)



The Ministry of Industry and Trade is responsible for the energy labelling of household appliances (see Act No. 406/2000 Coll. and the Decree No. 215/2001 Coll.) as well as the implementation of EU Directive No. 2002/91/EC on Energy Performance of Buildings.

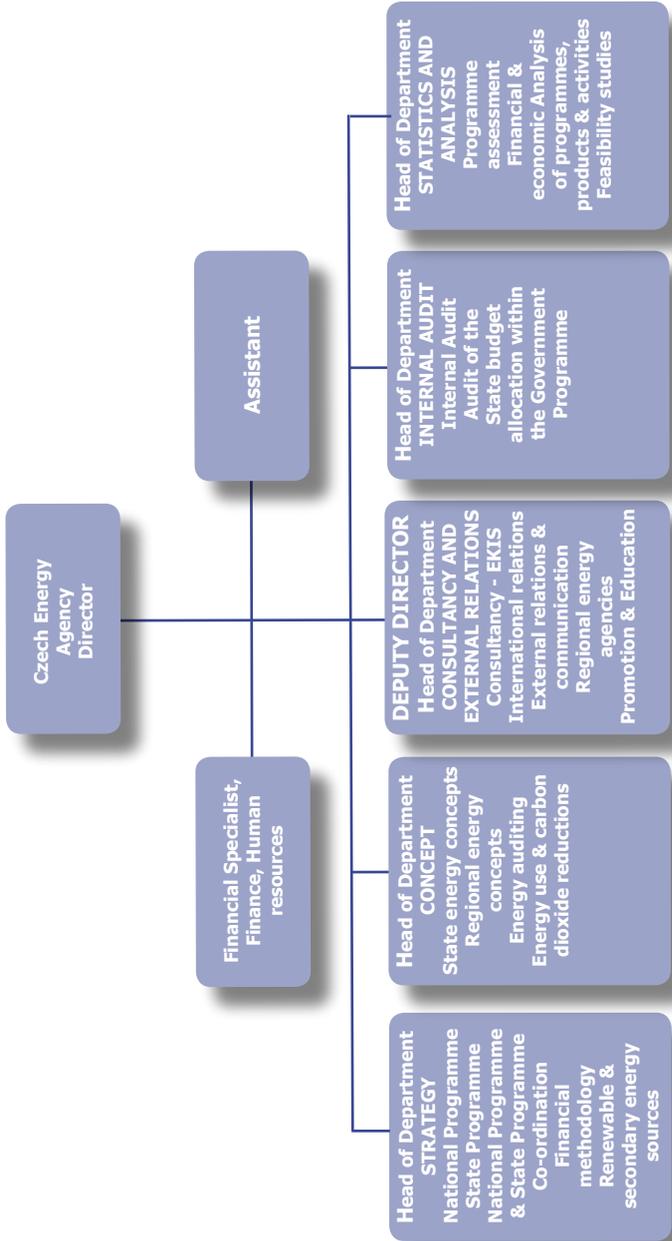
The CEA is under the Ministry of Industry and Trade, which is the implementing arm of the Ministry. It is a publicly funded organisation, founded in 1995. The mission of the CEA is "to support environmentally friendly energy use in this country – i.e. energy savings and the utilisation of renewable and secondary energy sources – through government funding and our team's expertise."

The CEA initiates activities of private and legal persons leading to energy savings aimed at reductions in overall energy demand. An integral component of its work is education and promotion.

The CEA has a staff of 21, of which 15 are experts with tertiary education and postgraduate qualifications.

Under the Director, there are five departments: Consultancy and External Relations; Strategy; Concept; Internal Audit; and Statistics and Analysis. Figure 15 shows the organisation of the CEA.

Figure 15: Organisation structure of Czech Energy Agency (valid as of January 2003)



## OTHER GOVERNMENT MINISTRIES AND BODIES

There are many ministries involved in energy efficiency policy and programmes. The most important ministries include Regional Development, Agriculture, Transport and Environment.

The State Housing Development Fund and the State Environment Fund are independent bodies with budgets outside the State budget. They support investments in buildings and the environment respectively.

The Energy Regulatory Office, described above, is responsible for the proper functioning of the restructured energy industries (electricity, gas and heat) in order to protect the consumer. The Office is involved in tariff setting. It does not have a mandate in promoting energy efficiency, since there is no specific requirement in Act 458/2000 Coll., from which the ERO takes its mandate.

The Energy Inspectorate oversees the compliance of the Energy Act, the Energy Management Act and the Act on Prices. In terms of energy efficiency, its main role is in ensuring that the obligations under the Energy Management Act are carried out. This includes, for example, ensuring that measures proposed by an energy audit are carried out appropriately. Furthermore, the Energy Inspectorate would ensure that subsidy recipients under the National Programme of Efficient Energy Utilisation have provided true information in their application and assessments.

The Czech Office for Standards, Metrology and Testing is responsible for the elaboration of technical standards including minimum efficiency standards for electrical appliances.

There are other specialised bodies such as the Transport Research Centre that provide valuable technical support for policy and programme development.

## REGIONAL AND LOCAL AGENCIES

There are local advisory services that are supported by the Government Programme which provide:

- ✧ elaboration of energy audits, energy “passports” and regional energy concepts;
- ✧ modernisation of energy production and distribution installations;
- ✧ development of cogeneration;
- ✧ utilisation of renewable and secondary sources of energy;
- ✧ implementation of measures leading to a higher energy efficiency and reduction in greenhouse gases emissions;

- ✧ dissemination of the results of scientific research, as well as of research and development related to energy use; and
- ✧ validation of energy legislation in the Czech Republic and its harmonisation with the directives of EU.

The advisory offices form a network of Energy Advisory and Information Centres (EKIS) and Municipal Energy Advisory Centres (MEPs) throughout the country. Each centre has to have at least three advisors providing services to the public at pre-defined times. In 2003 there were a total of 52 of these centres with about 192 advisors in total. They are supported through Part A of the Government Programme.

There are also Regional Energy Agencies (KEA). Their main activities include:

- ✧ supporting the energy legislation and the environment at regional level;
- ✧ promotion and dissemination of information in the field of energy efficiency, energy savings and the utilisation of renewable and secondary sources of energy;
- ✧ supporting the implementation and operation of energy management systems in relevant regions;
- ✧ supporting the elaboration of energy audits, energy “passports” and regional energy concepts;
- ✧ identifying projects and assisting in their technical and financial preparation;
- ✧ identifying and obtaining finance both from local and foreign sources for energy efficiency projects with beneficial environmental impacts;
- ✧ establishing a subsidy fund to increase the energy efficiency and the utilisation of renewable and secondary sources of energy;
- ✧ support for the partnership and communications in the regions; and
- ✧ contacts and co-operation with foreign partners.

There are four of these regional agencies. They receive 40% of their funding from the Government Programme Part A.

## ENERGY SUPPLY INDUSTRY

Sections 2 and 6 above gave an overview of the structure of energy supply and distribution. The energy companies are active in supply but have no role in promoting energy efficiency. Some efforts were made in demand-side management in the 1990s but they have ceased. CEZ and some of the

electricity distribution companies participated in the ELI project to promote energy-efficient lighting.

Various industry supply associations are active in promoting the interests of the industry. Such associations include the Association for District Heating of the Czech Republic which has 119 members, representing over 70% of the heat produced. This association is a member of the European Heat and Power Association, based in Brussels. There is also COGEN Czech which is affiliated with COGEN-Europe.

The Association for Renewable Sources is another organisation which supports the development of renewable energy. There is a separate biomass association – CZ-BIOM – with 480 members to promote biomass. It holds four conferences annually, has its own magazine and has started research programmes. It is a member of the European Association of Biomass.

## ENERGY SERVICE INDUSTRIES

There is a growing number of energy service companies and the government is promoting them. There is no specific organisation to promote them.

## NON-PROFIT ORGANISATIONS/NETWORKS

### SEVEn

SEVEn, the Centre for Energy Efficiency, is an independent non-profit organisation. In 1999, due to a change in Czech law on foundations, it was registered as a public benefit corporation. SEVEn covers the costs of its activities through its contract work, proceeds from consulting, and grants.

SEVEn provides a variety of consulting services to the Government in the form of policy analysis, information development and dissemination, and programme development.

SEVEn has developed relationships with similar energy efficiency centres in other countries and participates in many international projects. It co-operates with domestic and foreign governmental bodies and organisations, financial institutions, private companies, cities and other municipal governments, schools and hospitals, various energy suppliers, NGOs and individuals. SEVEn organises a regular business/trade conference on energy efficiency.

### MUNEE

Through its Municipal Network for Energy Efficiency (MUNEE) programme the United States Agency for International Development (USAID) has created

a new programme to improve municipal energy efficiency. MUNEE looks to identify relatively low-cost ways to disseminate energy efficiency experiences around the region so that cities can learn from each other how best to improve their infrastructure and encourage their citizens to use energy more wisely. The goal of MUNEE is to design and implement innovative energy efficiency policies and identify barriers to their successful adoption. MUNEE is strengthening the capacity of regional and municipal stakeholders to develop and attract financing for energy efficiency projects in the countries of Central and Southeastern Europe, the Balkans, and the former Soviet Union, including the Czech Republic.

## 9. ENERGY EFFICIENCY AND THE ENVIRONMENT

Environmental issues are important in the Czech Republic. At the end of the communist period, the country was left with considerable environmental damage from energy-intensive industry and the power sector which both were highly dependent on coal and which had poor environmental controls.

The Czech Republic's environmental policy is heavily influenced by EU policy. This includes the directives on air pollution from industrial plants, on limiting emissions of certain pollutants from large combustion plants, and on integrated pollution prevention and control. Industrial pollution reduction will need an investment of CZK 285 billion by 2010.

Measures needed to improve air quality require investment of an estimated CZK 19 billion by 2010.

Climate change is a priority area for environmental policy. There is a national target of a 20% reduction by 2005 of CO<sub>2</sub> emissions from the base year 1990. The Kyoto Protocol target is -8 % in the period 2008-2012 from the base year 1990. The Government sees no problem in achieving these targets even if there is high economic growth until then. The Czech Republic has prepared three national communications for the UN Framework Convention on Climate Change. The last one was published in 2001.

Once the Kyoto Protocol comes into effect, Joint Implementation (JI) will be an important element. The JI phase began in 2002. The methodology has been prepared, including the administrative procedures for the approval of projects. The necessary institutional structures (e.g. a JI office) are being established in the Czech Republic. There has been active interest from investor countries.

There is interest in emissions trading, although the Government feels there are a number of issues that have not been resolved to decide whether JI or emissions trading will have the priority.

The Ministry of Environment states that there are a number of problems that must be solved. There is a lack of adequate human and financial resources to prepare for the Kyoto Protocol flexible mechanisms. To be effective, a proactive approach is needed but there is concern whether the Government is ready to take such an approach, especially given that it will achieve the Kyoto target without any special effort. There are some technical problems concerning data quality and availability and legal, financial and organisational issues that will impact on effectiveness. Eventually, the balance between JI and emissions trading will have to be resolved.

At the present time a new national climate change strategy is under preparation.

The Ministry of Environment administers the State Environmental Fund which was set up in 1991. Revenue comes from fines and fees. Subsidies are to renewable energy sources, a priority area for funding which currently gets about 20% of all of the Fund's financing (CZK 0.7 billion out of a total of CZK 3.5 billion). There is no possibility of funding energy efficiency investments.

Table 5 provides some CO<sub>2</sub> indicators in the Czech Republic.

Table 5: CO<sub>2</sub> Indicators

	1990	1999	2000
Total CO <sub>2</sub> emissions (Mt/year)	165.490	118.083	127.903
Share residential sector (%)	13.0	8.3	n.a.
Share industrial sector (%)	17.20	28.94	28.30
Share transport sector (%)	4.80	10.18	8.70
Share other (%)	65.0	52.85	n.a.
Total CO <sub>2</sub> /GDP (10 <sup>3</sup> tonnes/mill. USD 1990)	6.04	4.33	4.54
Total CO <sub>2</sub> /capita (tonnes/inhabitants)	15.97	11.48	12.45
Total CO <sub>2</sub> / TFC (tonnes/toe)	5.40	4.80	5.26

Note: excluding forestry production

Source: Czech Statistical Office, Czech Hydrometeorological Institute

The Ministry of Environment is presently working on proposals for environmental tax reform. The objectives of the reform are to reduce GHG emissions, reduce other pollutants, achieve higher energy efficiency, achieve energy savings,

change the behaviour of energy consumers and increase the use of renewable energy. There is a working group composed of representatives from various ministries to discuss implementation issues.

The principles of the tax reform are to:

- ❖ Increase the consumer taxes on mineral oils;
- ❖ Introduce consumer taxes on solid fuels and on electricity;
- ❖ Achieve tax neutrality;
- ❖ Reduce taxes on labour; and
- ❖ Provide financial support for renewable energy and ecological modes of transport.

## 10. ASSESSMENT OF PROGRESS

### GOVERNMENT POLICY AND STRATEGY – OVERALL ASSESSMENT

Since 1990, the Czech Republic has seen major changes in its energy system, moving from a planned approach to one that has largely been restructured; has had a large but incomplete investment in pollution controls and modernisation; has started unbundling; has reformed prices to remove all subsidies and cross-subsidies; and has increased flexibility and competition. The fuel mix has changed, with a greater share of natural gas and nuclear electricity and a lower share of coal. The country is still highly dependent on imported energy but it has diversified sources. It has promoted greater use of renewable energy and has established a framework for energy efficiency improvements.

The Energy Act and the Energy Management Act form an important legislative base. They provide for a well-functioning industry, protect consumers and ensure energy policy and energy efficiency policies and programmes will be developed and approved by the government. The overall objectives of energy and energy efficiency policies are strong and realistic.

One major concern is, however, the role of energy efficiency in policy making. It is mentioned as being part of the energy policy but it is not included in the Energy Act. The newly created Energy Regulatory Office has no role in promoting energy efficiency. There are examples in both EU and candidate countries where the general energy act provides a signal to all market players of the importance of energy efficiency at all points in the energy cycle. This aspect is missing in the Czech legislation. It would not be as much of a problem if the Energy Management Act gave a role to the Energy Regulatory Office, but it does not.

Energy policy still gives a strong priority to energy supply. This includes renewable energy. A balance is needed, but the full benefits of a more balanced approach to energy supply and demand issues have not been fully addressed in policy and legislation.

There are also many benefits from greater emphasis on energy efficiency that would help with environmental policy, with industrial development policy and trade policy. Industry, for example, is still highly energy-intensive, with a high share of coal consumption. Being more energy efficient will allow industry to be more competitive internationally. It will also help industry to reduce its emissions, providing significant environmental benefits.

A comparison of the budgets for energy supply support (including renewables) with those dedicated to energy efficiency gives an impression of the imbalance.

The new energy concept being developed is a perfect opportunity to incorporate energy efficiency into the energy equation earlier and achieve in this way the right balance between supply and demand issues.

## ENERGY PRICING AND TAXATION

Most of the energy pricing issues has been solved with the elimination of cross-subsidies in 2002. It is important to continue to monitor prices to ensure that consumers are getting the correct pricing signals to motivate them to take energy efficient actions.

There is concern by some market actors that the heat industry is being unfairly treated compared to other industries, particularly electricity. The district heating infrastructure has had considerable investment in the 1990s. District heating, especially when combined with cogeneration, can be very efficient in terms of cost, energy and the environment.

The ecological tax reform is an important step aiming at internalising environmental externalities into energy prices. This is a welcome step.

## SECTORAL POLICIES AND PROGRAMMES

The National Programme on Energy Efficiency and Utilisation of Renewable and Secondary Sources of Energy is based on the Energy Management Act. The Programme is divided in two main parts where the Ministry of Industry and Trade is responsible for the main element of the Programme – Programme A – which is implemented by the Czech Energy Agency.

As described above the Programme combines mandatory measures (such as energy audits depending, for example, on the level of consumption) with subsidies, information (including education, training and advice). There are measures targeted to all end-use sectors.

One of the major concerns is the budget. In general, there is concern about the overall budget for energy efficiency, which has declined significantly since the mid-1990s, while the need for energy efficiency measures and the emphasis on environmental issues have increased. There is an imbalance between the funding of energy efficiency and renewable energy, with energy efficiency receiving only a fraction (between one-seventh and one-tenth) of the funding of renewable energy. While renewable energy is important and there are indicative targets, the large electricity generation capacity surplus, which will last for years, will make it difficult to favour renewable energy in electricity production.

There are many policy measures related to the residential sector, in part mandated by the EU and in part responding to the specific needs of the country due to the poor condition of "panel" buildings. There is a valuable emphasis on information, education and training. Lack of information is traditionally one of the most difficult barriers to overcome. There is a strong network of advice centres around the country that needs to be sustained. It is a challenge for the government to provide consistent tools to these centres to ensure that consumers are not receiving conflicting information and to ensure that "best practice" is being promoted. Information is also provided through appliance labelling (using the EU approach) and there is a need to ensure that these are well implemented and are effective in influencing consumer choice. Effectiveness can be enhanced through working with retail outlets.

The new EU Directive on Energy Performance of Buildings, introducing such elements as energy labelling and building standards, is a challenge for all EU member states to implement by 2006. Indications are that there will be no problem in the Czech Republic in implementing, but every effort is necessary to ensure that the momentum is maintained. Working with other Member States and candidate countries on this issue may prove beneficial. One area that has to be addressed is the building code which has not been revised since 1994. During the revision process it may prove beneficial to consider making the thermal efficiency standards mandatory for all buildings, since, at present they are only voluntary for private buildings if there is no state subsidy.

Panel buildings pose a major challenge because of the scale of the problem and the costs of improvement. The programmes available are, on the whole, good but more synergy between the programmes is needed to enhance overall effectiveness.

The commercial sector has a number of subsidies available. The new EU Directive on Energy Performance of Buildings will increasingly influence

the thermal standard of commercial buildings. There is a need to continue the energy auditing, advice, information and training, which are important initiatives. With the service sector growing, it is important to ensure that new buildings are designed and built to the state-of-the-art. The IFC/GEF project on energy-efficient lighting has worked to develop lighting ESCOs. Given the high share of electricity used for lighting, every encouragement should be given to the promotion of ESCOs.

The public sector is the subject of many programmes, several involving direct subsidies and subsidised energy audits. There are also many pilot projects. Energy use in the public sector is important in all countries and energy efficiency gains will contribute to alleviate strained government budgets. It is important to promote "best practice", to remove institutional barriers to encourage institutions, such as schools, hospitals and other public institutions to promote energy efficiency. The government should also ensure that all barriers are removed to allow third party financing in the public sector, as is required under EU Directive 93/76/EEC. The Government has an opportunity to undertake measures in the public sector which can be used as demonstration projects to increase the awareness in other sectors about the possibilities for improving energy efficiency. This has proven successful in several PEEREA countries.

Several programmes target the industrial sector, but there is a general concern that more is needed. The industrial sector is very energy-intensive compared to most other PEEREA countries, especially compared to those that are as highly dependent on energy imports as the Czech Republic. The industrial structure is a legacy of the old economic system but it is also a reflection of strong traditions and country specific conditions. The Czech Republic was well placed in Central Europe for combining coal and raw materials from throughout the region for the manufacture of goods. The industrial sector has benefited from low labour costs to support its competitiveness. This advantage will gradually erode and it is important to learn the lessons from many other PEEREA countries of the importance of improving the efficiency of energy use as a means to improve competitiveness. Much can be done through promoting best practice and by supporting industry to find its own solutions through the use of voluntary agreements and by monitoring energy use.

Finding effective approaches in the transport sector is difficult in all PEEREA countries. But the sector remains important because it a driver for increasing energy demand and because of its high dependency on petroleum products. The Ministry of Transport has developed a comprehensive approach but it appears that the lack of the funds needed for effective implementation is in impacting the effectiveness of the policy.

## CHP, DH AND RENEWABLE ENERGY

CHP, district heating and renewable energy are all promoted through the national energy policy. District heating holds an important share of the heat market in the residential, commercial and industrial sectors. Much of the heat sector was modernised in the 1990s and it is now in a better condition than in many other transition countries. The investments have also been important in reducing emissions. The main problem is to ensure that district heating is not unfairly penalised as liberalisation continues. There are currently some concerns about the penetration of electrical heating. From life cycle analysis, electrical heating would not be beneficial for the environment or for improvements in energy efficiency.

Renewable energy policies are driven by the desire to improve energy security and to meet the indicative targets for electricity from renewable energy of the European Union. These are important drivers but the policy has to take into consideration the high over-capacity in electricity generation. A least-cost energy analysis would show that improved energy efficiency may deserve a higher priority vis-à-vis renewable energy than it currently has, as for example expressed by budgets allocated to each area.

## ENERGY EFFICIENCY AND THE ENVIRONMENT

Environmental policy is heavily influenced by international obligations: European Union membership, the UNFCCC and the Kyoto Protocol, to name two of the most important of them. The total funding to meet the environmental obligations under the EU's *acquis communautaire* is very high and, even though it can be spread over a number of years, it represents a major challenge for the Government.

The Czech climate change strategy is currently being revised and it is important to continually review progress and objectives. Meeting the Kyoto target will be no problem for the Czech Republic under any growth scenario. There is consequently no political pressure on deciding how the target will be achieved. However, this situation could lead to complacency by not taking advantage of the many opportunities for "selling" excess credits through Joint Implementation or emissions trading. The capacity for JI implementation is being developed, but is the review team's belief that energy efficiency could better benefit from JI investments than it is currently the case. The country has considerable potential for energy efficiency improvements and there is concern that the Czech Republic will not take full advantage of JI in providing needed investments.

Investments are made through the State Environment Fund which has a significant funding and which achieve a strong impact. Renewable energy is

supported through this Fund but it is recommendable to allow energy efficiency investments in its activities.

## INSTITUTIONAL ARRANGEMENTS

The involvement of many ministries and agencies in implementing the National Programme on energy efficiency allows integrating energy efficiency into other spheres of government. It has, however, been recognised that co-ordination amongst ministries has been less than optimal in many circumstances and that it should be strengthened in order to secure integration. This is an area that should be given further attention. PEEREA working documents could provide guidance in this area.

The Ministry of Industry and Trade is responsible for developing energy efficiency policy and there is concern that it does not have the capacity to undertake the policy formulation and data gathering and analysis necessary for fully developing an energy efficiency policy. Alternatively, this work could be carried out in the CEA if desirable, but the Agency does not have such a mandate. The field of energy efficiency is getting more complex, especially given the obligations under the European Union, and good analytical capacity is important.

The CEA is well organised and implements the programmes capably, given its mandate. However, the programmes are becoming more complex to implement (an example is the EU Directive on Energy Performance in Buildings) and the Agency needs to have a stronger capacity in the area of programme development and implementation. The relationship between the Agency and the Ministry needs to be reviewed to determine whether a more flexible arrangement could improve programme delivery. There are a number of PEEREA working documents that could help the Ministry and Agency in this area.

The CEA could also play a more pro-active, catalytic role in promoting energy efficiency amongst the various actors, both within and outside government. There is a tendency to see the mandate of various institutions in strict legalistic terms which is hampering the overall national effort to promote energy efficiency in all sectors. This overly structured approach can lead to a lack of dynamism and leadership that the success of energy efficiency policies depends on in all countries.

It is welcome to see the development of local advisory agencies and regional energy agencies. This strengthens the capacity to deliver all types of programmes directly to end-use consumers. The greatest effectiveness is through sustainability and consistency. In some other PEEREA countries, networks established have lost effectiveness over time due to lack of funding and changing priorities. The local networks need to be monitored on a regular

basis to ensure that they are sustainable and that they are offering appropriate and consistent programmes throughout the country.

## 11. RECOMMENDATIONS

### GENERAL

- ✧ While energy policy includes energy efficiency as a priority, the focus is mainly on energy supply; energy efficiency should receive a higher priority within the new State Energy Concept being developed, in order to ensure a more balanced, flexible and sustainable energy policy.
- ✧ In the process of market liberalisation, the Government should develop and implement instruments for improving end-use energy efficiency.
- ✧ Formal adoption of the *acquis communautaire* related to energy efficiency should be followed up by strengthening capacity and securing adequate resources for effective implementation.
- ✧ Energy efficiency policies should be better integrated into the strategies of all economic sectors, like industry, agriculture and transport.

### ENERGY EFFICIENCY LEGISLATION, POLICIES AND PROGRAMMES

- ✧ The energy legislation (Energy Act 458/2000 Coll.) should incorporate elements on energy efficiency in order to signal to all market actors its importance; the Energy Regulator Office should integrate energy efficiency aspects into market regulation.
- ✧ The Energy Management Act 406 should include provisions relevant to the organisation responsible for energy efficiency implementation and inter-programme co-ordination.
- ✧ Overall and sectoral energy efficiency targets, based on comprehensive end-use analysis, should be incorporated into the National Programme for the Energy Effective Management and the Utilisation of Renewable and Secondary Sources of Energy.
- ✧ Government objectives and priorities should be supported by appropriate budgets for energy efficiency programmes and institutions.

### INSTITUTIONAL FRAMEWORK

- ✧ The capacity for energy efficiency policy analysis within the Ministry of Industry and Trade should be strengthened to reflect the growing importance of energy efficiency and the international obligations

assumed by the Czech Republic in this respect, including those implied by accession to the European Union.

- ✧ The mandate and capacity of the Czech Energy Agency should be strengthened in order to ensure better implementation of energy efficiency policies.
- ✧ Co-ordination between ministries in terms of promoting energy efficiency should be better developed, possibly through a better institutional framework.
- ✧ The government should promote the development and sustainability of local capacity to provide consumer information, training and related services in the field of energy efficiency.

### SPECIFIC PROGRAMMES

- ✧ Industrial energy efficiency programmes should be developed to address the high share of industrial energy consumption in total final consumption in order to improve its international competitiveness and to make a significant contribution to the national climate change strategy.
- ✧ The government should consider introducing legislation requiring energy supply companies to undertake demand-side management activities with their retail customers and to allow such activities to be considered as eligible costs.
- ✧ The Government should prepare and provide the necessary resources for the implementation of the EU Directive on the Energy Performance of Buildings; preparatory work may require intensive work at the EU level for the harmonisation of efforts.
- ✧ In order to ensure greater energy efficiency in existing buildings, the government should secure good co-ordination and exploit the synergies between the activities of the State Housing Development Fund and the other programmes of the Ministry of Regional Development.
- ✧ The Government should develop a programme for energy use in public facilities as a means of raising awareness and promoting the benefits of greater energy efficiency.
- ✧ Energy labelling of new passenger cars should be developed and implemented according to European Union legislation.
- ✧ The implementation of the existing strategy of energy efficiency in transport should be supported by adequate resources.
- ✧ Raising public awareness on energy efficiency should be enhanced by education programmes at various levels.

## COGENERATION, DISTRICT HEATING AND RENEWABLES

- ✧ The Government should continue monitoring the evolution of the heat market with a view to secure fair and transparent conditions for the operation of the district heating systems and for the promotion of cogeneration.
- ✧ Policies on renewable energy sources should be better co-ordinated with energy efficiency to ensure a more balanced and cost-effective solution.

## ENERGY PRICES, FISCAL POLICY AND ENERGY EFFICIENCY FUNDING

- ✧ Energy prices should better reflect environmental costs and other sustainable development objectives.
- ✧ The State Environment Fund should allow a greater range of energy efficiency projects to be funded.
- ✧ The proposed environmental tax reform should take into account the benefits that energy efficiency improvements bring to the environment.
- ✧ The Government should remove the barriers (mainly legal, fiscal and regulatory/administrative) to the effective operation of third-party financing schemes.

## ENVIRONMENTAL POLICY

- ✧ The strategy to meet the Czech Republic's obligations under the Kyoto Protocol and beyond as well as the broader climate change strategy should more adequately define and promote the role of energy efficiency as one of the most cost-effective means.

# ANNEXES

## ANNEX 1 ENERGY SITUATION IN THE CZECH REPUBLIC

The Czech Republic is highly dependent on imported energy. Its main domestic sources are coal and uranium with only limited amounts of oil and gas. There is some potential for greater use of renewable energy, although limited at present. The structure of TPES has changed significantly over the last decades. In 1973, 78% of TPES was coal and now it is down to approximately 50%. While the share of oil has not changed significantly, natural gas has gone from 2.2% in 1973 to 19% in 2001. In 2001, over 25% of the energy needs were imported. Main imports are oil and natural gas.

Given its location, the Czech Republic is a major transit route for oil, gas and electricity in Central Europe.

The Czech Republic has expanded its nuclear energy capacity, bringing the Temelin nuclear plant into operation in recent years. It is still in the pilot phase, even though it is being operated at almost full capacity. Nuclear now represents about 40% of total electricity generation. The Czech Republic is a major exporter of electricity.

According to the IEA, installed capacity has increased 3% since 1996 to 15.2 GW, implying a reserve margin of over 50%, well above domestic demand, and this was before the Temelin nuclear plant was brought into operation.

In 2001, renewable energy contributed 2.1% of TPES, according to the IEA. The shares of all the energy sources were:

Energy Sources	Percentage
Coal	50.9%
Oil	20.3%
Gas	19.4%
Renewables	2.1%
Nuclear	9.3 %

Final energy consumption by sector in 2001 was as follows<sup>16</sup> :

Sector	Final Energy Consumption (%)
Industry	42.7%
Transport	20.1%
Residential	22.5%
Other	14.6%

Table A1.1. Basic indicators and selected energy production, supply and consumption statistics

	1990	1996	1998	1999	2000	2001
GDP (billion 1995 US\$)	54.61	54.27	53.29	53.54	55.28	57.09
Population (millions)	10.36	10.32	10.29	10.29	10.27	10.26
Total Primary Energy Production (Mtoe)	38.51	32.47	30.74	28.02	29.86	30.49
Net imports (Mtoe)	7.63	10.38	10.53	9.65	9.41	10.67
Total Primary Energy Supply (TPES) (Mtoe)	47.40	42.25	41.05	38.24	40.38	41.40
TPES/GDP (toe per thousand 1996 US\$)	0.8680	0.7785	0.7703	0.7142	0.7304	0.7252
Total Electricity consumption (TWh)	57.44	59.10	57.70	56.50	58.49	60.20
Electricity consumption per capita (KWh/cap)	5,543	5,730	5,605	5,493	5,694	5,867

Source: IEA, *Energy Balances of OECD Countries, 2000-2001, 2003 Edition*

<sup>16</sup> IEA, *Energy Balances of OECD Countries, 2000-2001, OECD, 2002*

Table A1.2. Total final energy consumption by end-use sector (Mtoe)

	1990	1996	1999	2000	2001
Residential	7.34	6.09	5.60	5.47	5.77
Industry	15.52	14.33	10.24	9.91	9.85
Services	3.41	2.03	2.62	2.41	3.23
Transport	2.25	3.81	4.38	4.55	5.15
Agriculture	1.45	0.75	0.57	0.56	0.27
Non-specified	0.73	0.67	1.41	1.36	1.30
Total (TFC)	30.7	27.68	24.82	24.27	25.57
TFC/GDP (toe/US\$)	0.56	0.51	0.46	0.44	0.45

Source: *Energy statistics & Balances of OECD/NON-OECD countries 1995-1996, OECD/OCDE 1998 Edition, OECD/OCDE2001 Edition, For 2001: IEA Energy Balances, 2003 Edition*

Czech Statistical Office

Table A1.3. CO<sub>2</sub> emissions 1990 – 2000

	1990	1999	2000
Total CO <sub>2</sub> emissions (Mtonnes/year)	165.49	118.083	127.903
Share residential sector (%)	13.0	8.3	n.a.
Share industrial sector (%)	17.2	28.94	28.3
Share transport sector (%)	4.8	10.18	8.7
Share other (%)	65.0	52.85	n.a.
Total CO <sub>2</sub> /GDP (10 <sup>3</sup> tonnes/mill. USD '90)	6.04	4.33	4.54
Total CO <sub>2</sub> /cap (tonnes/inhabitants)	15.97	11.48	12.45
Total CO <sub>2</sub> /TFC (tonnes/toe)	5.4	4.8	5.26

Note: excluding forestry production

Source: Czech Statistical Office, Czech Hydrometeorological Institute

## ANNEX 2      SELECTED END-USE DATA TABLES

Table A2.1. Total final energy consumption by source, residential sector (Mtoe)

	1990	1996	1999	2000
Total	7.34	6.10	5.72	5.47
a. Electricity	0.85	1.38	1.23	1.11
b. Heat	1.15	1.08	1.36	1.31
c. Oil products	0.15	0.06	0.06	0.05
d. Gas	1.54	2.15	2.10	2.06
e. Coal	3.51	1.04	0.65	0.61
f. Combust. Renew. & Waste	0.14	0.39	0.32	0.33
g. Others	0	0	0	0
Floor Area (10 <sup>6</sup> m <sup>2</sup> )	261.3	267.2	272.1	273.8
No. of dwellings (10 <sup>3</sup> )	3,706	3,802	3,865	3,890
Residential use per dwelling (toe/dwelling)	1.9	1.6	1.4	1.4
Residential use per surface (toe/m <sup>2</sup> )	0.028	0.023	0.021	0.020

Source: *Energy statistics & Balances of OECD/NON-OECD countries 1995-1996, OECD/OCDE 1998 Edition, OECD/OCDE 2001 Edition*

Czech Statistical Office

Table A2.2. Final energy consumption by industry sector/energy source 2000 (Mtoe)

	Mining	Manufacturing							Construction	Total
		Iron and Steel	Chem. & petrochem	Non ferrous metals	Food & tobacco	Paper pulp and print	Non metallic minerals	Other		
Coal	0.01	0.93	0.20	0.02	0.03	0.10	0.06	0.17	0.01	1.53
Crude Oil	0.03	0.14	0.73	0.02	0.02	0.02	0.10	0.03	0.17	1.26
Petroleum Products	0.02	0.62	0.80	0.13	0.36	0.09	0.13	0.30	0.09	2.54
Gas										
Nuclear										
Hydro										
Geothermal Solar etc.										
Combust. Renew. & waste										
Electricity	0.02	0.20	0.51	0.11	0.10	0.18	0.12	0.27	0.05	1.55
Heat								3.03		3.03
Total	0.08	1.89	2.24	0.28	0.51	0.39	0.41	3.80	0.32	9.91
Value added per sector 1990 USD (USD x 10 <sup>6</sup> )	917	1,210	2,926	1,899	2,258	1,394	940	7,120	2,534	21,180
Energy/value added (PJ/USD 10 <sup>6</sup> )	0.004	0.065	0.032	0.0006	0.009	0.012	0.018	0.022	0.005	0.020

Source: Energy Statistics & Balances of NON-OECD countries, OECD/OCDE 2001 Edition, NB industry non-energy use is not added to sector industry

Czech Statistical Office

Table A2.3. Final consumption of services by energy source (Mtoe)

Service sector	1996	1997	1998	1999	2000
Total	2.03	2.08	2.39	2.62	2.41
a. Electricity	0.85	0.87	0.89	0.87	0.89
b. Heat	0.23	0.27	0.31	0.33	0.31
c. Oil products	0.08	0.03	0.03	0.06	0.06
d. Gas	0.79	0.83	1.10	1.20	1.14
e. Coal	0.08	0.07	0.06	0.06	0.03
f. Combust. renew. & Waste				0.01	0.01
g. Others					
No. of employees (mil.)	0.876	1.070	1.050	1.024	1.028
Floor area (1,000 m <sup>2</sup> )					
Value added in (10 <sup>6</sup> USD)	12,207	11,836	11,131	13,101	13,192
Energy/value added (PJ/10 <sup>6</sup> USD)	0.007	0.007	0.009	0.007	0.009
GJ/Employee					
GJ/m <sup>2</sup>					

Source: *Energy statistics & Balances of NON-OECD countries 1995-1996, OECD/OCDE 1998 Edition, OECD/OCDE 2001 Edition*

Czech Statistical Office

Table A2.4. Transport indicators (2000)

	Freight	Travel	Total
FC (Mtoe)	1.845	2.705	4.55
10 <sup>9</sup> tonne-km	56.442	-	
TFC (ktoe)/10 <sup>6</sup> tonne-km	0.0327	-	
10 <sup>9</sup> Person-km		82.7	
TFC/person-km (TFC(ktoe)/10 <sup>6</sup> person-km)		0.033	
Number of cars/1,000 inhabitants	31	362	

Source: Czech Statistical Office, SRC International CS, Prague, CR

## ANNEX 3 ENERGY PRICES AND TAXES

### Energy prices end use sectors 2000 (USD per Unit)

	Un-leaded gasoline 95 RON (litre)	Light fuel oil (1,000 litres)	Diesel (litre)	Heavy fuel oil (tonne)	Nat gas (10 <sup>7</sup> kcal GCV*)	Steam Coal (tonne)	Electricity (kWh)
Industry	0.605	299.2	0.525	111.61	147.8	14.46	0.043
Households (incl. 22% VAT)	0.743	411.5	0.640		214.4	25.84	0.0544
Electricity generation	-	-		111.61	146.4	7.98	-

\* Gross calorific value

Source: Energy prices & taxes, quarterly statistics, OECD/IEA

Note: Annual average exchange rate 1 USD = 38.59 CZK (2000)

### Energy prices end use sectors 2001 (USD per Unit)

	Un-leaded gasoline 95 RON (litre)	Light fuel oil (1000 litres)	Diesel (litre)	Heavy fuel oil (tonne)	Nat gas (10 <sup>7</sup> kcal GCV*)	Steam Coal (tonne)	Electricity (kWh)
Industry	0.589	239.7	0.520	125.1	155.9	15.2	0.043
Households (incl. 22% VAT)	0.719	339.6	0.634		233.0		0.060
Electricity generation	-	-		125.1	151.7	8.0	--

\* Gross calorific value

Source: Energy prices & taxes, quarterly statistics, OECD/IEA, 2002

Note: Annual average exchange rate 1 USD = 38.02 CZK (2001)

## STATE ORGANISATIONS:

- ✧ Ministry of Industry and Trade (Ministerstvo průmyslu a obchodu)
- ✧ Ministry of Environment (Ministerstvo životního prostředí)
- ✧ Ministry for Regional Development (Ministerstvo pro místní rozvoj)
- ✧ Ministry of Agriculture (Ministerstvo zemědělství)
- ✧ Ministry of Foreign Affairs (Ministerstvo zahraničních věcí)
- ✧ Ministry of Transport (Ministerstvo dopravy)
- ✧ State Energy Inspectorate (Státní energetická inspekce)
- ✧ Energy Regulatory Office (Energetický regulační úřad)
- ✧ Czech Energy Agency (Česká energetická agentura)
- ✧ State Environmental Fund (Státní fond životního prostředí)

## OTHERS:

- ✧ ČEZ a.s.
- ✧ Transgas a.s.;
- ✧ Association for District Heating of the Czech Republic
- ✧ OTE a.s. –Electricity Market Operator
- ✧ ČEPS, a.s. – Czech Energy Transmission Company Ltd.
- ✧ STE a.s. – Power Distribution Company
- ✧ Association for Renewable Sources
- ✧ SEVEn o.p.s.
- ✧ ENVIROS s.r.o.
- ✧ TEDOM s.r.o.

## GLOSSARY

CHP	Combined heat and power, also known as co-generation
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CEA	Czech Energy Agency
CKR	Czech koruna
DSM	Demand-side management
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECS	Energy Charter Secretariat
EU	European Union
Eurostat	Statistical Office of the European Communities
€	Euro
IEA	International Energy Agency
GDP	Gross Domestic Product
GHG	Greenhouse gas
GJ	Gigajoule
kcal	Kilocalorie
kt	Kilotonne
ktoe	Thousand tonnes of oil equivalent
kW	Kilowatt
kWh	Kilowatt hour
LPG	Liquified Petroleum Gas
m <sup>2</sup>	Square metre
m <sup>3</sup>	Cubic metre
MIT	Ministry of Industry and Trade
MJ	Megajoule
Mt	Million tonnes
Mtoe	Million tonnes of oil equivalent
MW	Megawatt
MWh	Megawatt hour
NGO	Non Governmental Organisation
NO <sub>x</sub>	Nitrous oxide
OECD	Organisation of Economic Co-operation and Development
PEEREA	Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects
TJ	Terajoule
TPES	Total Primary Energy Supply





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