

1. EXECUTIVE SUMMARY AND KEY RECOMMENDATIONS

EXECUTIVE SUMMARY

The energy policy framework of the Czech Republic is set by the State Energy Policy adopted in 2004. The basic priorities are to strive for independence from foreign energy sources; maximise the safety of energy sources, including nuclear; and promote sustainable development. Since the last in-depth review in 2005, the Czech Republic has further liberalised its electricity and gas markets and has made commendable efforts to enhance oil and gas security.

The Czech Republic is the third-largest net electricity exporter in the European Union, after France and Germany. Electricity generation is largely composed of domestic coal (60%) and nuclear (32%), whereas natural gas (3.5%) is mainly used as complementary fuel in multi-fired units and for peaking purposes. Combined heat and power (CHP) constitutes one-third of electricity generation and over 40% of overall heat production, making the country the third-largest in CHP use after Denmark and Finland.

The Czech Republic imports nearly all of its oil and gas requirements, but imports are reasonably well diversified. Possibilities to exploit new coal resources are currently limited by past decisions taken on environmental grounds and the concerns of local populations. Taking into account the importance of the coal industry and its long-term contribution to the country's security of supply, there is increasing pressure to revoke the original decision of the government to limit exploitation of brown coal reserves.

According to the Kyoto Protocol, the Czech Republic is committed to reduce its greenhouse gas (GHG) emissions by 8% by 2008–2012 compared to 1990 levels. In 2007, GHG emissions were down by almost 22% below 1990 levels, and there should be no difficulties for the country to meet its Kyoto commitments. Despite a significant drop in total GHG emissions since 1990, per-capita emissions are still higher than the EU average and much higher than the global average.

The Czech government faces several challenges in fulfilling its energy policy objectives. The draft State Energy Concept (which is the preliminary document establishing a new energy policy, to be released in 2010) relies heavily on the maximum use of domestic resources thus focusing mainly on energy security but lacking a certain degree of coherence in climate-related policies. The Czech government could do more to implement energy efficiency policies and measures. Further, the government should clarify its role as an electricity exporter in the future.

THE DRAFT STATE ENERGY CONCEPT

In preparation for a new Energy Concept, to be adopted in 2010, the Czech government created an Independent Expert Energy Commission, charged with assessing the

country's long-term energy needs. The Commission delivered its final report to the government in January 2009. Since then, the Ministry of Industry and Trade published a draft update of the State Energy Concept (SEC) in September 2009. Separately, the Ministry of the Environment issued a draft Climate Protection Policy (CPP) in October 2009.

The draft State Energy Concept provides a scenario of the Czech energy market to 2050 with shorter-term objectives and policy recommendations. The Concept concentrates on the need for security of energy supply and the maintenance of the Czech Republic as a net electricity exporter, achieved through a diversified energy mix and maximising the use of indigenous resources, comprising coal, uranium and renewable energy, mainly biomass and waste. Future expansion of nuclear capacity has been presented as one of the major pillars of the updated draft SEC.

Encouragingly, according to the current version of the draft update, nuclear energy is projected to account for about 47% of the power generation mix in 2050 up from 32% currently, which will support the Czech government's efforts to achieve climate change objectives. Coal is projected to fall from 60% to about 12% of the generation mix in 2050, less than the projected share of renewable energy sources which will rise to about 30%. Gas will continue to play a complementary role (about 11%). The Concept outlines indicative targets for domestic resources, including nuclear fuel, with 90% and 80% shares in overall electricity and district heating, respectively. This would be a substantial transformation of the Czech electricity sector.

Although gains have been made in reducing energy intensity in the industry sector, the potential for energy efficiency improvements in the buildings and transport sectors is substantial. Energy use and carbon dioxide emissions in these sectors are growing. Energy efficiency is considered the low-hanging fruit in efforts to reduce energy consumption and address climate change, while also providing benefits for energy security. The transport sector is singled out in the draft SEC as a priority sector, which is a positive development. The main objectives are to expand public transport and incentives to reduce road traffic (for example by working from home) in the short term and to diversify the fuel and technology mix over the longer term.

In developing a national mid- and long-term integrated energy and climate policy, due account should be taken to particularly long-term needs for GHG emissions reductions. The Czech government needs to take actions today to meet these long-term objectives. Fortunately, current emissions reductions have provided the Czech Republic with a significant surplus of tradable emission allowances in the first commitment period of the Kyoto Protocol. The Czech government should be commended for reinvesting the profits resulting from the use of the Kyoto Protocol's flexible mechanisms in measures under the Green Investment Scheme but more efforts will be needed to achieve the necessary long-term emissions reductions.

In developing an integrated energy and climate change policy which takes account of both national objectives and European policy constraints and targets, the government should encourage greater consultation between ministries (notably the Ministry of Industry and Trade and the Ministry of the Environment, but also the Ministries of Transport and of Agriculture). It could also consider the scope for greater co-ordination with neighbouring countries aiming at common energy security and climate change objectives. The government should examine different scenarios of future energy use and production and consider re-evaluating its proposed policies. Reducing emissions over the

long term will be challenging for the Czech Republic because of its heavy reliance on coal and its small potential for expanding the use of renewable energy sources. Specifically, the Czech Republic should concentrate resources on implementing energy efficiency policies and measures. The 2009 edition of the IEA *World Energy Outlook* highlighted that over half of the reductions in global emissions needed in its 450 ppm Scenario to 2050 can be achieved through energy efficiency improvements.¹

Given the need for major investments in infrastructure over the next few years to achieve the necessary long-term policy goals, it is particularly important that the Czech government agrees quite soon a coherent and credible policy framework to provide a stable and competitive business climate for such investment to be made.

GREAT STRIDES IN ENERGY SECURITY BUT NEED MORE FOCUS ON CLIMATE CHANGE

Energy security is at the core of the Czech energy policy and is prioritised mainly by preferential use of all available domestic resources. This is largely attributed to the perception of external risks to supply and to the comparative advantage of some of the national energy industries, in particular coal mining and power generation. The Czech Republic established an Expert Group on Energy Security in 2006 and a Raw Materials and Energy Security Department within the Ministry of Industry and Trade in October 2009. The updated draft State Energy Concept highlights a variety of strategic priorities centred on enhancing energy security, and the ministry is planning to prepare a comprehensive energy security strategy in 2010.

The Czech Republic is in compliance with the IEA obligation regarding oil stocks. Since the last in-depth review, the progress achieved in terms of improving security of gas supply is commendable but must be continued further. The provisional reserve flow capacity from Germany, high storage withdrawal and Norwegian supplies enabled the Czech Republic to face a disruption of Russian supplies in January 2009 while maintaining deliveries to all essential customers.

Major targets outlined in the draft State Energy Concept include priority use of domestic resources, including uranium, and further diversification of oil and natural gas supplies, for which a specific target has been set to limit the share of one source to the maximum level of 65% of total annual consumption. The target implies a reduction of imports from Russia, a policy reinforced by the Russia-Ukraine dispute in January 2009 and a fear of similar supply disruptions in the future. This has triggered the application of energy security-related strategies in a wider context.

The Czech Republic plans substantial increases in gas storage capacities, the development of interconnections with neighbouring countries and a further extension of its natural gas transmission grid to provide for larger volumes of reverse flow. Emergency measures have also been identified in order to be better prepared for any significant reduction in natural gas imports. The Czech Republic's long-term strategy for the electricity sector has also been affected by the perception of risks related to natural gas security of supply. The Czech government should consider potential future developments in the regional natural gas market and the positive role that gas plays in addressing climate change and, if feasible and economical, consider expanding the role

1. The 450 scenario shows abatement options needed to limit the long-term concentration of greenhouse gases in the atmosphere to 450 parts per million (ppm) of CO₂-equivalent and to keep the global temperature increase to around 2 degrees Celsius above pre-industrial levels.

of gas in a long-term strategy to reduce emissions. Gas-fired plants are the second-fastest plants to build, after wind farms, and are less subject to NIMBY² than coal or wind. They also provide reserve capacity for wind, since the intermittency in Baltic wind represents an increasing issue for the Czech transmission system operator.

The draft State Energy Concept is built on the general philosophy that domestic resources are the most secure for improving the energy situation in the Czech Republic. But energy security benefits targeted by the maximum use of domestic resources need to be complemented by detailed assessments on economic efficiency and environmental sustainability of the formulated actions. Improvements in energy efficiency and wider demand-side measures, regional integration in electricity and natural gas markets and optimising the need for new infrastructure are among the areas through which the Czech Republic could also strengthen its energy security. In this respect, the comprehensive energy security strategy should seek an efficient set of policies taking into account all the relevant economic, social and environmental factors.

Further focus and detailed road-maps are essential for ensuring robust long-term strategies, particularly in the areas pertaining to efficiency improvements, development and deployment of advanced combustion technologies, sustainable coal and other low-carbon technologies, and flexible and wider use of fuel-switching options. Given the energy-intensive structure of the Czech economy and the strong seasonality in electricity and heat demands, facilitation of demand-side measures, in particular with participation from industry, should contribute to the efforts of the Czech Republic to enhance energy security and environmental sustainability in a cost-effective manner.

CLARITY REQUIRED REGARDING FUTURE ROLE AS ELECTRICITY EXPORTER

The updated draft State Energy Concept envisions a self-sufficient and export-oriented electricity sector, largely motivated by the government's perception of risks related to energy security. On the generation side, refurbishment of the existing capacity, mainly through efficiency improvements, and timely and effective replacement of coal-fired plants that are retired will be essential for maintaining a surplus as desired by the government. Continuous monitoring and evaluation of the supply-demand balance with further co-ordination among the Ministry of Industry and Trade, the Energy Regulatory Office (ERO) and the transmission system operator (ČEPS) are necessary for providing clear signals to the market to achieve the desired growth targets for the Czech electricity system. Creating a market-oriented environment should remain the core aspect of any action to direct generation investments in parallel with the long-term policy goals of the government.

The Czech Republic's transmission system could allow electricity exchange options with all its neighbouring countries. The net transfer capacity of the existing interconnections of 17 cross-border lines is over 30% of Czech installed capacity. Further extension of the infrastructure through the construction of new lines and modernisation of existing lines is planned for the period to 2026. These developments are consistent with the export-oriented strategies of the Czech Republic.

Further development of cross-border infrastructure will be necessary for the establishment of regional and European Union-wide physical electricity markets. The Czech government should co-ordinate and co-operate with neighbouring governments

2. "not in my backyard" which refers to public resistance to energy infrastructure being constructed.

and transmission system operators in order to ensure that growth in electricity supply is compatible with the regional supply and demand balance.

The role of the energy regulator and the Office for the Protection of Competition will continue to be central in monitoring market developments as the partially state-owned utility, ČEZ, has a dominant position in the Czech electricity market.

The development of additional nuclear facilities will, in the first place, be aimed at replacing fossil fuel-fired power plants at the end of their lifetime. While some of the Czech Republic's neighbouring countries have nuclear facilities or are considering their development, others either do not have nuclear plants or are potentially shutting them down. In this environment, the Czech Republic should consider supporting co-operation among governments and system operators at the regional level in order to avoid the development of excess capacity over the longer term. Regional co-operation should also be encouraged with regard to radioactive waste storage/repository facilities.

A common day-ahead market has been launched between the Czech Republic and the Slovak Republic, formulated on the principle of implicit auctions. In the case of the Polish, Slovak and both German interconnections, co-ordinated explicit auctions are also organised in co-operation with neighbouring transmission system operators. These developments are positive for the establishment of a regional electricity market. In this context, the Czech Republic should continue to co-operate with its neighbours to ensure functioning electricity markets, without any restrictions on imports.

IMPORTANCE OF TECHNOLOGY DEVELOPMENT

Given the ambitious CO₂ emissions reduction goals agreed by the European Union and the Czech government's plans for coal use in power generation, the country will need to actively pursue the development of sustainable coal technologies. Without reducing the carbon footprint of coal combustion, it will be difficult to meet the desired long-term GHG emissions reduction targets. On the other hand, a radical switch in the fuel mix which reduces the share of coal could have adverse effects on the country's security of supply. The government should pursue the greater deployment of available clean coal technologies and research and development of other sustainable coal technologies, in particular carbon capture and storage (CCS). Other priorities should include the development of electricity storage and smart grids.

A CCS policy should be established. Potential investment in CCS at the industrial scale will depend on future coal availability within the context of a decision on mining limits and on addressing the problem of insufficient storage potential. So far, there has been only a handful of publicly funded research projects focused on CCS.

It is commendable that the Czech Republic sustains numerous high-level research and development projects in nuclear technology, including Generation III and IV reactors, notably in the Nuclear Research Institute. It should continue to build on its national strengths and capacities and engage in international programmes.

KEY RECOMMENDATIONS

The government of the Czech Republic should:

- Build on the draft State Energy Concept, on the Climate Protection Policy and on the report by the Independent Expert Energy Commission to develop coherent energy and climate strategies, including a vision to 2050 consistent with the latest EU policies in these areas, and consider different scenarios to assess in particular the economic and environmental sustainability of the proposals.*
- Use the revenues accrued from the use of flexible mechanisms under the Kyoto Protocol to encourage, in a cost-effective manner, measures to further reduce greenhouse gas emissions in the near term.*
- Assess the economic and social costs and benefits of enhancing energy security through the predominant use of domestic energy resources and, if necessary, consider low-carbon energy sources, such as gas, in devising a long-term strategy to reduce emissions.*
- Support co-operation among governments and transmission system operators at the regional level, in order to ensure that growth in electricity supply is compatible with the regional supply and demand balance, and strengthen co-operation with neighbouring countries to develop a functioning regional electricity market.*
- Develop an integrated strategy to improve energy efficiency, addressing both primary and final energy use, particularly in the buildings and transport sectors, and improving the co-ordination and cost-effectiveness of different energy efficiency schemes.*