

European Energy Liberalization, and the Integration of Eastern Europe with EU Energy Markets and Environmental Initiatives

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¹ Copyright Magdalena A K Muir 2002. This presentation draws upon an article published in the Utilities Law Review in December 2001, and ongoing research on energy markets and regulation, and implementation of the Climate Change Convention.

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Introduction

It is with pleasure that I discuss initiatives for the development of an internal energy market in the European Union, and related developments in eastern Europe. My oral remarks will of necessity be briefer than these written remarks. However, I would refer to these written remarks for a more complete discussion, as well as to references in the footnotes.

European energy liberalization is underway to develop an internal market for electricity and natural gas. Energy initiatives for the European Union are occurring in conjunction with measures to implement energy efficiency, renewable energy, and emissions trading of greenhouse gases. Within this internal market, competition is developing between nations and within national markets, as private and state entities engage in the energy markets to realize a profit and minimize costs. While there are broader competition and trade issues, these remarks focus on energy liberalization, market issues, environmental measures and emissions trading for the European Union and three adjacent eastern European countries.

Since the demise of communism and the collapse of the Soviet Bloc as an economic and political union, eastern European countries are seeking to enter the European Union. Simultaneously, energy liberalization is occurring throughout eastern Europe, and particularly in Poland, Czech Republic and Hungary. The transparency and operation of these energy markets is of key importance in the discussions for the accession of eastern European countries to the European Union.

In response to European directives and policies and national initiatives, the European energy market is evolving at the same time as environmental measures for energy are being considered. Unlike North America, the internal market for Europe Union is developing as requirements for renewable energy and energy efficiency are implemented. Further, in the European Union, proposals for emissions trading of greenhouse gases under the Climate Change Convention are occurring in close proximity to energy liberalization. As a result, European energy liberalization will include renewable energy and energy efficiency, and be consistent with emissions trading.

These remarks will summarize energy liberalization in the European Union. Environmental measures, the implementation of the Climate Change Convention, and the role of emissions trading emission are examined to determine their inter-relationship with energy liberalization. This is followed by a specific examination of energy markets, environmental measures and emissions trading for Denmark and the United Kingdom.

The remarks will then briefly address the accession of Poland, Czech Republic and Hungary to the European Union, the liberalization of their energy markets, and eventual integration of these markets into the national and regional energy markets of the European Union. The remarks conclude with preliminary observations of interactions between the European Community and eastern European countries such as Poland, Czech Republic and Hungary on energy and related environmental measures.

European Union

Energy liberalization in the European Union

Energy liberalization in the European Union (EU) is occurring as a result of Directives, and policy papers and national initiatives, though this liberalization is occurring inconsistently and at various paces in the different member states. Energy liberalization is also being implemented in the context of initiatives to encourage renewable energy and energy efficiency.

The European Community is a regional economic integration organization, and has criteria for trade and competition on a sectoral and regional basis. One of the major goals of the Community is to eliminate barriers between member states. This is accomplished, first, through the prohibition of barriers to trade between member states and, second, through the harmonization of differing national legislation by the adoption of European Community legislation.² A commitment to economic liberalization, and energy liberalization have been reaffirmed as recently as March 2002 at a meeting of EU leaders in Barcelona.

In Lisbon in 2002, the leaders agreed to transform Western Europe into the "world's most competitive and dynamic economy" by 2010. In 2002, Spain, the host country for the meeting, was pushing its partners to make headway on a number of areas where Europe is perceived as lagging behind the United States. Priorities identified for the EU include job creation, education and training, the development of a single market in financial services, and the integration of European energy, transportation and communications networks. Energy received the most attention with the European Parliament approving draft legislation in March 2002 that would allow cross-border energy competition by 2005. The EU's energy commissioner, Loyola de Palacio, was been pushing for full deregulation of electricity and gas for 2005 at this meeting.³ However, the need for comments and commitment also reflects regional difficulties in places such as France with opening energy markets.

The directives for energy liberalization have been designed to harmonize different national legislation, though some restrictions on trade and competition may be allowed

² Interim report at 21, from "FIELD Report and Scoping Papers, Designing Options for Implementing an Emissions Trading Regime for Greenhouse Gases in the EC" (July 7, 1999)

³ New York Times article by E. Daly dated March 15, 2002, "European Meeting will Focus on Freer Rein for Economy".

for environmental reasons.⁴ The Internal Market for Electricity Directive 96/92 is the first European-wide step to create an open and competitive electricity market, with this Directive being implemented in most states for February 20, 1999. Countries have until this date to bring into force laws, regulations and administrative matters, and Belgium, Ireland and Greece have additional time.⁵ The Internal Market for Electricity Directive 96/92 establishes common rules for generation, transmission, and distribution of electricity. Under Article 11 of the Internal Market for Electricity Directive, a country may provide for priority for dispatch for electricity from renewable sources, wastes, and from combined heat and power processes. This allows for provisions that favour environmental friendly energy over other forms of electricity.⁶

As the Internal Market for Electricity Directive was scheduled for implementation for February 1999, there is some experience in electricity liberalization. The United Kingdom implemented market reforms beginning in the 1980s. Denmark is opening its energy markets along with measures for emissions trading and to ensure renewable energy. Germany opened its electricity market for this date, and Austria was scheduled shortly thereafter, though the market is currently open according to the minimum requirements of the Directive. France is beginning to open its markets, though EDF, the national French monopoly and largest generator in Europe, has been selling into other markets and investing in utilities. The liberalization of energy markets, with related opening and unbundling has led to significant decreases in electricity costs for industrial customers, and open markets for smaller consumers.

The Directive of the European Parliament and of the Council Concerning Common Rules for the Internal Market in Gas addresses liberalization of natural gas, and states were required to implement it for August 2000. The Directive established common rules on the storage, transmission, supply of natural gas, as well as detailed rules on the organization and functioning of the natural gas sector. Firms must be operated on a commercial basis, and discrimination for rights or obligation is prohibited. States may impose public service obligations for security of supply and services, quality and price of gas, and environmental protection. Primary requirements of the Directive are that member states open at least 33% of their gas market to competition by 2008, and that third party have access to pipelines and other facilities on a non-discriminatory basis.⁷

⁴ European nations are also parties to other agreements in relation to energy. The Energy Charter process is sometimes used to refer to the 1991 European Energy Charter, the 1994 Energy Charter Treaty (as amended by the 1998 Trade Amendment) and the 1994 Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects.

⁵ Internal Market for Electricity Directive 96/62 (December 19, 1996), and European Commission, Guide to the Electricity Directive.

⁶ Internal Market for Electricity Directive 96/62, Article 11.3.

⁷ Directive of the European Parliament and of the Council Concerning Common Rules for the Internal Market in Gas 98/30 (June 22, 1998).

Environmental measures for energy

Policies and measures established at a European and national level favour environmentally friendly energy, which is likely to be electricity. These policies and measures may be distinct from energy liberalization and the implementation of the Climate Change Convention, or fulfill multiple purposes. These policies and measures are occurring simultaneously with the development of an internal European energy market.

In March 1997, the European Commission proposed a common system of taxation of energy products. This proposal required taxes on all energy products, and allowed member states to implement tax reforms to reduce distortions in competition for the internal energy market. This proposal was unsuccessful, and no similar tax proposals have been introduced since that time.⁸

The 1995 White Paper, *An Energy Policy for the European Union*,⁹ prioritizes security of supply and lowering energy costs, while acknowledging a future role for renewable energies. The Green Paper for a Community Strategy, *Energy for the Future: Renewable Sources of Energy* was published in November 1996, and followed by a White Paper of the same title in November 1997.¹⁰ This White Paper set a number of goals including doubling the market share of renewable energy in the Europe to 12 % by 2010.

The European Commission has considered a further Directive to address the interaction between renewable energy and the internal electricity market. In 1999, the European Commission proposed a Draft Directive for electricity from renewable energies based on this White Paper. The first draft Directive was subsequently withdrawn due to lack of agreement. A second draft of the Directive was introduced in May 2000. The version of the Directive is entitled *Proposal for a Directive of the European Parliament and of the Council on the Promotion of Electricity from Renewable Energy Sources in the Internal Electricity Market*. It confirms goals to be achieved for 2010 by the Community and each member state for the market participation of renewable electricity. As the target for renewable energy is 12 %, approximately 22 % of electricity must come from renewable sources by that date. The Directive discusses different means of achieving this result, either through quota based systems, using either green certificates or tendering, or fixed price schemes. Each state may decide how best to support renewable energy, provided

⁸ European Commission, *Common System for Taxation of Energy Products* (Brussels, March 12, 1997).

⁹COM(95)682.

¹⁰ Green Paper for a Community Strategy, *Energy for the Future: Renewable Sources of Energy* (COM(96)576) (November 19, 1996) followed by White Paper for Community Strategy, *Energy for the Future: Renewable Sources of Energy* (COM (97)599) (November 26, 1997).

they do not interfere with the operation of the internal energy markets.¹¹ The goals set by the Electricity from Renewable Sources Directive are not mandatory, but only guidelines. The European Commission will however review the progress towards a higher proportion of renewable electricity and reserves the option to set mandatory goals.

Countries are proceeding in different manners to implement renewable energy in their energy markets. For example, Germany and the Netherlands have differing strategies of fixed prices and quota-based systems, respectively. Germany has provided fixed high rates for renewable energies. The Renewable Energy Law of April 1, 2000 and predecessor legislation have resulted in significant incremental electricity generated by renewable sources, but that electricity must be generated in Germany to receive these rates. In contrast, the Netherlands has implemented a voluntary quota system.

Implementation of the Climate Change Convention

Under the Kyoto Protocol to the United Nations Framework Convention on Climate Change, industrialised countries who are Annex 1 Parties agree to reduce their emissions of six greenhouse gases by an average of 5.2 % below 1990 levels for the period 2008 to 2012. The Kyoto Protocol provides legally binding targets for these Annex 1 Parties, and for the use of various flexibility mechanisms for the transfer and acquisition of "assigned amounts", "emission reduction units" and "certified emissions reductions". Article 3 of the Kyoto Protocol establishes "assigned amounts" for all Annex 1 Parties, and provides for the transfer and acquisition of assigned amounts among parties. A party is allowed to transfer or acquire any part of an assigned amount from another party in accordance with Article 6 or 17. The assigned amounts are the basis for the "cap and trade" mechanism for Annex 1 Parties.

Article 4 allows Annex 1 Parties to co-operate to fulfil their commitments. Article 4 also permits the establishment of "administrative bubbles" for the transfer of assigned amounts. The European Community can be viewed as one of these administrative bubbles or as a single entity for the purposes of an emissions trading regime, as the European Union and its member states are signatories to the Kyoto Protocol. Central and eastern European countries are also signatories to the Kyoto Protocol.

Article 17 provides that parties included in Annex B of the Protocol may participate in emissions trading to meet commitments under Article 3. This participation is in addition to domestic actions under Article 3. Emissions trading under the Kyoto Protocol is restricted to the parties listed in Annex B of the Protocol. This group consists primarily of northern members of Organisation for Economic Co-operation and Development, as well as central and eastern European countries and some of the states from the former Soviet Union. Parties without binding emission reductions and limitation objectives can not participate in trading. Developing countries and industrial countries that do not ratify the

¹¹ European Commission, Proposal for a Directive of the European Parliament and of the Council on the Promotion of Electricity from Renewable Energy Sources in the Internal Electricity Market (May 2000) at 1-14.

Kyoto Protocol, or who are not included in Annex B of the Protocol, can not participate. At the current time, private parties may participate in emissions trading if their government is listed in Annex B and provides them with an opportunity.¹²

Despite the silence of the United States at the COP6 Bonn discussions, parties to the Convention were able to agree on means of proceeding. On July 23, 2001, the 180 members of the Convention on Climate Change reached preliminary agreement on Kyoto Protocol rules. Draft text was issued on July 23 with final text being issued on July 24, 2001 (the Bonn Agreement). Key aspects of the Bonn Agreement include the establishment of different funds, the use of carbon sinks, the rules for Clean Development Mechanisms, and rules for the international emissions trading regime.¹³ At the Marrakech conference or COP7 from 29 October to 9 November 2001, parties to the Convention finalized the operational details of the Kyoto Protocol, opening the way to widespread ratification by governments and the Protocol's early entry into force. The finalized Kyoto rulebook specifies how to measure emissions and reductions, the extent to which CO₂ absorbed by carbon sinks can be counted towards the Kyoto targets, how the joint implementation and trading systems will work and the rules for ensuring compliance with the commitments.¹⁴

On 4 March 2002, the European Union indicated that it honours its commitment to early ratification of the Kyoto Protocol. The Council of the EU energy ministers adopted the Commission's proposal for a decision to ratify the Kyoto Protocol. By its decision to ratify the Protocol at the EU level, the European Union supports its ambition to have the Kyoto Protocol come into force for the World Summit on Sustainable Development in August and September 2002. The decision also makes member states' greenhouse gas reductions of June 1998 legally binding.¹⁵ Some specific policies in relation to climate change are discussed below.

¹² This discussion of emissions trading and the Climate Change Convention draws upon the Kyoto Protocol; European Commission, COM(2000)87 dated March 8, 2000: "Green Paper on Greenhouse Gas Trading within the European Union" at 6; F Missfeldt, Flexibility Mechanisms: Which Path to Take after Kyoto (RECIEL, Vol. 7, Iss. 2, 1998 at 128); F. Yamin, The Kyoto Protocol: Origins, Assessment and Future Challenges (RECIEL, Vol. 7, Iss. 2, 1998 at 113); F. Joshua, "Can Pollution be Traded?", GLOBE "Guru Lecture" on International Greenhouse Gas Emissions Trading (April 23, 1998); and Dr. H. E. Ott, "Emissions Trading in the Kyoto Protocol- Finished and Unfinished Business", Linkages Journal, Vol. 3, No. 4 (October 26, 1998).

¹³ Press release entitled "Governments adopt Bonn agreement on Kyoto Protocol rules" dated July 23, 2001 from Framework Convention on Climate Change Secretariat; and Decision 5/CP. 6: Implementation of the Buenos Aires Plan of Action (July 24, 2001).

¹⁴ Press release from the COP7 website, <http://unfccc.int/cop7/>.

¹⁵ Press release dated 5 March 2002 entitled "EU honours commitment to early EU ratification of the Kyoto Protocol" on European Commission website, <http://europa.eu.int/environment/climat/whatsnew.htm>.

Under the Kyoto Protocol, Europe agreed by 2010 to reduce emissions of greenhouse gases to 8% below 1990 levels. According to estimates, Europe will require a 14% reduction in greenhouse gases, in comparison to the situation where no action is taken to implement the Convention. Emissions trading, both internally in the Community and with other industrialized countries, is intended to help Europe and its member countries meet their commitments. On 17 May 1999, the European Union Council of Ministers agreed to a Community strategy for climate change.

The European Community has proposed a limited emissions trading regime by 2005, in the "Green Paper on Greenhouse Gas Trading within the European Union."¹⁶ The European Commission's Communication (2000)88: EU Policies and Measures to Reduce Greenhouse Gas Emissions: Towards a European Climate Change Programme" discusses some of the complimentary policies and measures being considered to implement the Convention.¹⁷ The European Climate Change Programme is discussed in the "European Climate Change Programme- Long Report" of June 2001.

The Green Paper addresses European strategy for the security of energy supply discusses the energy supply shortfalls and investment in this sector. This discussion occurs in the context of climate change and the gradual integration of internal markets for natural gas and electricity.¹⁸ The Communication on EU Policies and Measures to reduce Greenhouse Gas Emissions has guidelines on state aid for environmental protection will be updated to encourage the use of new market-based incentives. The aim of preventing climate change is also be considered by the European Commission when assessing a country's state aid schemes. Annex 3 of the Communication provides a list of the proposed common and co-ordinated policies and measures on climate change. Council Decision 99/296 EC has a monitoring mechanism for Community CO₂ and other greenhouse gases that will be used for the assessment of policies and measures, but needs to be extended to the use of flexibility mechanisms.¹⁹

The European Community's Green Paper on Greenhouse Gas Emissions Trading in the European Union provides a preliminary continental perspective for emissions trading.

¹⁶ European Commission, COM(2000)87 dated March 8, 2000: "Green Paper on Greenhouse Gas Trading within the European Union" at 4. COM (1999)230 dated May 5, 1999: Communication from the Commission to the Council and the European Parliament "Preparing for Implementation of the Kyoto Protocol".

¹⁷ COM (2000)88 Communication from the Commission to the Council and the European Parliament on "EU Policies and Measures to reduce Greenhouse Gas Emissions: Towards a European Climate Change Programme" (March 8, 2000).

¹⁸ European Commission, Com (2000)769 dated November 29, 2000: "Green Paper : Towards a European strategy for the security of energy supply."

¹⁹ Ibid, at 2-5 and Annex 3.

It was issued on March 8, 2000,²⁰ and provides an overview of the Community perspective for emissions trading, the role of national initiatives, and a number of observations which are relevant for emissions trading and energy liberalization. Emissions trading is intended to complement other policies and measures, which should be the main means of implementing the Convention and would include energy taxes, regulatory or technical standards, and environmental agreements already in place. Possible negative effects on international competitiveness are minimized if other industrial countries are involved in emissions trading.²¹ The Green Paper states that emissions trading provides incentives to find the lowest cost of achieving emissions reductions. The Green Paper observes the importance of protecting the internal European market by avoiding the scenario where emissions trading regimes create excessive barriers to trade, restrict the right of establishment of companies, or distort competition. The paper also acknowledges the importance of avoiding incompatibilities between trading regimes and multilateral trade agreements.

A discussion of the roles of the European Community for European and national trading schemes is interwoven through the Green Paper, and it suggests that a Community-wide approach might be the most appropriate. The possibility of a gradual extension of the regime is also raised, as new member states enter the European Union, or as non-European countries who are part of the European Economic Area participate in the Community regime.²² The Green Paper highlights the debate as to whether emission trading regimes will be implemented on a continental basis or a national basis, or in some combined fashion. There is the recognition of the necessity of widespread trust in the system. The financial markets must have confidence in national and private trades of assigned amounts and emission reduction units of greenhouse gases.

Interaction of energy liberalization and emissions trading

Given the emphasis on an internal energy market, a European emissions trading regime is likely to be consistent with energy liberalization. Impacts on energy liberalization, as well as trade and competition issues, seem to occur more at the state or regional level where Directives and policies are implemented. Energy liberalization has progressed from Green Papers to White Papers to implemented Directives. Europe has also been experiencing positive benefits from energy liberalization at a regional and sectoral level. In contrast, emission trading is at the stage of Green Papers, with a Draft Directive being proposed but not yet issued. There is no final agreement on the European Community's role for emissions trading, the structure and rules for emissions trading, or the impact of

²⁰ The Green paper also referred to two background documents, "FIELD Final Report: Designing Options for Implementing an Emissions Trading Regime for Greenhouse Gases in the EC" and "CCAP Working Paper: Design of a Practical Approach to Greenhouse Gas Emissions Trading Combined with Policies and Measures".

²¹ European Commission, COM(2000)87 dated March 8, 2000: "Green Paper on greenhouse gas trading within the European Union" at 6-7.

²² Ibid, at 13 -16.

emissions trading on the upstream energy sector and, more particularly, electricity generation.

Emissions trading regime for Europe will conform to energy liberalization and will be subject to energy markets, particularly with respect to the upstream energy sector and electricity generation. For example, there may be the situation of decentralized or privatized electricity generation which is subject to national and international pricing constraints. In that instance, energy liberalization could encourage the implementation of emissions trading and related policies and measures at the point of electricity consumption, rather than generation, as this might avoid distortion of the electricity market and impacts on prices that could otherwise occur.

Denmark energy markets and liberalization

Denmark and the United Kingdom have different approaches to energy markets and liberalization, environmental measures and emissions trading. Unlike the United Kingdom, Denmark is introducing energy liberalization concurrently with an emissions trading regime for electricity generation and measures to increase renewable energy participation. Unlike other Nordic countries, Denmark has limited hydro resources, and relies on other forms of electricity generation including coal. Renewable energy was first investigated following the oil crisis in the early 1970's, when the state required utilities to install a certain amount of renewable generation capacity. By the late 1980's, the focus of Denmark's energy policy had shifted from economics and security of supply to environmental concerns. Renewable energy was focused predominantly upon wind resources but also biomass, so that wind now accounts for 6% of Denmark's energy supply.²³

On March 3, 1999, Denmark's political parties entered in an Electricity Reform Agreement, which establishes a framework in which consumer protection, environment and the security of supply are protected in a liberalized electricity market. The agreement establishes the organization and opening of the electricity market. The agreement also provides a framework for CO₂ emissions from the electricity sector, and for developing renewable energy for a period up to the end of 2003.

The Electricity Reform Agreement is being implemented by five Acts which were authorized by the Folketinget in May and June of 1999: the Electricity Supply Act; the Bill on CO₂ Quotas for Electricity Production; the Bill to Amend the Act on Subsidies for Electricity Production; the Bill to Amend the Act on the Utilization of Renewable Energy Sources; and the Bill to Amend the Heat Supply Act. The Electricity Reform Agreement provides a blueprint for reform of the electricity sector from 1999 to 2003. By the end of 2002, all consumers will be able to choose their electricity supplier. Consumer with an annual consumption in excess of 1 GWh per place of consumption have choice of

²³ Realm Research Group, Renewable Electricity and Liberalising Markets, Phase 1: Inception Report (March 1999, ECN-C-99-007) at 16.

supplier for the end of 2000. Electrical companies are modified to unbundle their monopoly and competition areas.

Electrical distribution companies will continue to function as grid companies, but must unbundle other corporate functions. Grid companies operate the grid and receive a reasonable return on their investment capital. Supply obligation companies and system-responsible companies provide electricity to consumers in a supply area, and are responsible for security of supply, respectively. Supply obligation companies may make a price regulated profit, while system-supply companies receive a reasonable return on investment. All three types of companies have consumer representatives on their boards. Lastly, production and trading companies are run as ordinary commercial companies, subject to some price regulation and restrictions on their ownership of the other three types of companies.

Renewable energy is addressed by a variety of means, including Green Certificates for electricity produced from renewable energy. Consumers are obliged to purchase an increasing share of electricity from renewable energy, till that level reaches 20 %. There are also a variety of regulated prices and price subsidies for renewable electricity, and rules and government guarantees designed to underpin the construction of facilities for renewable energy generation.²⁴

After internal European re-allocation, the Denmark received a 5 % target reduction under the Climate Change Convention. Denmark set a national target of reducing CO₂ emissions by 20 % in 2005 compared to 1988. Denmark had made considerable progress in the energy sector in reducing these emissions through energy savings, increased use of combined heat and steam facilities, renewable energy, fuel switching and increased efficiency of power plants. However, this effort was nullified by extra CO₂ emissions from 1994 to 1997 as a result of Danish electricity exports to the Nordic electricity market. These exports came from Danish coal-fired plants as the result of low rainfall in Sweden and Norway. This situation also highlighted issues with CO₂ regulation in an open electricity market, and contributed to the development of Denmark's current approach.²⁵

CO₂ Quotas for Electricity Production Act²⁶ creates a framework for regulation of CO₂ as well as reduced emissions from fuels used for electricity production in Denmark. Emissions trading for CO₂ is based on an annual national ceiling of allowable emissions for the electricity sector since that sector is responsible for 40% of the country's total CO₂ emissions. The ceiling is reduced each year going from 22 million tonnes in 2001,

²⁴ Electricity Reform Agreement between the Danish Government, the Liberal Party, the Conservative Party and the Christian People's Party on legislative reform of the electricity sector, dated March 3, 1999 at 2-8.

²⁵ S L Pedersen, Danish CO₂ Emissions Trading System (2000).

²⁶ Bill on CO₂ Quotas for Electricity Production. This Bill was adopted by the Folketinget on May 28, 1999, and is Act no. 376 as of June 2, 1999.

to 21 million tonnes in 2002, to 20 million tonnes in 2003. The national quota is allocated for free to electricity producers based on historical emissions during the period 1994-98, and cover 70 of the historical emissions of each energy producer. Producers generating electricity through application of CO2 free methods, such as wind or waste, are exempt from the Act. Electricity producers who produce less than 100,000 tonnes of CO2 annually are also exempt. This de minimis threshold ensures that 90 % of total CO2 emission from electricity production will be included in the permit system, but that only 10 to 15 of the total of 500 electricity producers will be affected by the permit system.²⁷

The system of tradable emission permits provides an incentive to reduce electricity production or to use less polluting technology. Excess permits may be sold in a bilateral trade to another producer, for whom it is cheaper to buy permits than pay the fine of DKK 40 or 5.40 Euro per tonne. A producer can also save or bank permits that are not used in one year for the next year. Each year, the quota for the producer is also adjusted taking into account the national quota for the particular year, the transactions made and whether emissions permits have been saved. Revenue from fines is paid into the Danish Treasury, and used for energy saving purposes.²⁸

The Act discusses possible impacts of emissions trading on electricity sales in Denmark and exports into the Nordic electricity system. Denmark uses coal for electricity generation, and exchanges electricity with the Nordic mainly hydro electricity based system. The charge of DKK 40 per tonne CO2, where emissions exceeds a company's permits, provides the company with an economic incentive not to exceed the quota for emissions. This quota will be exceeded depending on the price for which Danish companies can sell electricity. System calculations suggest that quotas will be surpassed at a market price greater than DKK .18/kWh. In periods when the electricity price for the Nordic market is low, electricity producers will not be affected by the Act as no sales will occur. In periods of high market prices and sales are likely to occur, the Act will reduce the electricity producers' profits.²⁹

On March 29, 2000, the European Commission approved the Danish scheme for tradable CO2 emission permits. The Commission viewed giving producers free emissions permits as state aid under Article 87(1) of the EC Treaty. It approved the state aid on the basis of Article 87(3)(c) of the EC Treaty, since the scheme will contribute to the development of environmental protection. However, approval of the Danish scheme is without prejudice to future decisions on emission trading permits. In order to respect the freedom of establishment, the state was required to allocate permits to new entrants to the Danish electricity market based on objective and non-discriminatory criteria, this criteria also being subject to Commission approval.³⁰

²⁷ Bill on CO2 Quotas for Electricity Production, Notes to the Bill.

²⁸ Bill on CO2 Quotas for Electricity Production, Notes to the Bill.

²⁹ Bill on CO2 Quotas for Electricity Production, Notes to the Bill.

³⁰ Communication "Commission approves CO2 quotas for electricity sector in Denmark for the period 2001-2003" (Brussels, March 29, 2000).

Viewing the Danish emission trading regime in the context of electricity liberalization, one could conclude that emissions trading is consistent with liberalization of generation as both aspects are integrated and implemented simultaneously. The overall system also incorporates measures to encourage renewable energy generation, and applies any revenues from emissions trading to the energy sector. As the regime only governs electricity generation in the upstream sector, energy efficiency is addressed by other measures in the downstream sector. In Denmark, there are electricity surpluses, with depreciated existing coal-fired plants and low electricity prices. New generation, particularly using fossil fuel, is not likely to occur in the near future. Renewable energy generation may be the exception given the level and extent of state support for this type of generation.

The United Kingdom energy markets and liberalization³¹

The United Kingdom has one of Europe's most open energy markets. Emissions trading regimes have been proposed and are being considered in conjunction with a Climate Change Levy, other policies and measures to implement the Convention, the Kyoto Protocol, and the country's internal energy and environmental goals. Emission trading is important in the UK given the nature of its energy markets. The United Kingdom also has a strong commitment to using market instruments for the implementation of environmental goals.

The United Kingdom proceeded independently with natural gas and electricity deregulation in the 1980's and early 1990's. The United Kingdom electricity sector meets the requirements of the Internal Market for Electricity Directive 96/92. Electricity was historically generated by coal, though there was a switch to natural gas as a result of the development of offshore hydrocarbon reserves. In the fall 2000, government eliminated a mandatory pool system for buying and selling electricity, and instead permitted buying and selling in different pools and exchanges and bilateral transactions.³² The United Kingdom's natural gas sector is open to competition, and meets most of the requirements of Directive 98/30/EC of the European Parliament and of the Council Concerning Common Rules for the Internal Market in Gas. Third party access exists for pipelines and other facilities with provisions for non-discrimination.³³

³¹ This discussion for the United Kingdom draws upon a recent articles by the author including "The United Kingdom and emissions trading for greenhouse gases" published in the EcoBulletin (Canadian Bar Association, Summer 2001).

³² Meetings with parties in the United Kingdom in May 2000 and further communications. Realm Research Group, Renewable Electricity and Liberalising Markets, Phase 1: Inception Report (March 1999, ECN-C-99-007) at 20-21. The Utilities Act 2000, and predecessor and related legislation have required these changes.

³³ United Kingdom Department of Trade and Industry, Consultation Document: Implementation of Directive 98/30/EC of the European Parliament and the Council of 22 June 1998 Concerning Common Rules for the Internal Market in Gas (May 2000).

The United Kingdom has embarked on measures to increase the participation of renewable energy and energy efficiency. Renewable energy was promoted in 1990 through the creation of the Non-Fossil Fuel Obligation/NFFO and the imposition of a Fossil Fuel Levy on domestic energy consumption. The NFFO has now been replaced by the Renewable Fuel Obligation under which electricity suppliers are required to purchase a portion of their energy requirements from generators of renewable energy. Distributors purchasing electricity from renewable energy sources get certificates as evidence of their purchase. To the extent they exceed their target, they can trade the excess, by either selling it to other distributors, or by converting their certificates to tradable CO2 permits in the emissions trading scheme.

United Kingdom has other initiatives for renewable energy and energy efficiency. These include Energy Efficiency Commitments, the Energy Efficiency Fund, enhanced capital allowances for energy efficient investments, as well as continuing past programs such as Energy Efficiency Best Practices Programmes.³⁴ Policy initiatives include requirements that electricity suppliers increase electricity from renewable resources to 10% by 2010, subject to acceptable costs; that electricity from combined heat and power, or co-generation, double by that time. Fuel efficiency of new cars is also scheduled to increase by 25% by 2008 to 2009 in accordance with environmental agreements with car manufacturers.³⁵

After internal European re-allocation, the United Kingdom received a 12.5 % target reduction under the Climate Change Convention. The United Kingdom set a domestic target of a 20% decrease in CO2 levels below 1990 levels by 2010. The United Kingdom's climate change policy stems largely from Lord Marshall's report of November 1998, and is composed of interrelated measures. These policy measures include the introduction of an energy tax known as the Climate Change Levy, with 80% discounts from the tax for designated energy intensive companies that enter into agreements with government to improve energy efficiency, and proposed emissions trading regimes. To soften the impact, government proposed an emissions trading regime. Other policies include a requirement to introduce energy efficiency measures under the new Integrated Pollution Prevention and Control Regime.

Under the Climate Change Levy, companies that have processes designated as part A processes under the Integrated Pollution Prevention and Control Regime, or the regime that replaces it, may opt for an absolute emissions cap, or a cap based on tonnes per unit of throughput. The Climate Change Levy applies to industrial and commercial users of energy, and covers primary and secondary fuel for lighting and heating; and power for industry, commerce, agriculture and public administration. The Levy is imposed on

³⁴ Department of Environment, Transportation and the Regions, *Energy Measures under the Climate Change Levy Package* (December 10, 1999).

³⁵ Department of the Environment, Transportation and the Regions, *Climate Change: Draft UK Programme Summary* (March 9, 2000).

energy supplied to industrial and commercial consumers, with differential rates are imposed for electricity, coal, coal and hydrocarbon derivatives, and natural gas and liquefied petroleum gas. There are exemptions to the Levy for new renewable energy and certain combined heat and power plants, and significant discounts for energy intensive sectors that sign energy efficiency agreements that meet government criteria.

In November 2000, the Department of the Environment, Transport and the Regions introduced a consultation document entitled "A Greenhouse Gas Emissions Trading Scheme for the United Kingdom". This trading scheme was primarily based on the recommendations of the UK Emissions Trading Group.³⁶ In May 3, 2001, the Department of Environment, Transport and the Regions announced the establishment of the Climate Change Projects Office, and released three documents. These documents are the "Draft Framework Document for the UK Emissions Trading Scheme"; the "Incentives Bidding Mechanism: Options for a mechanism to allocate incentives funding and set emissions reductions targets in the UK Emissions Trading Scheme"; and an "Analysis of Responses to Consultation Document: A Greenhouse Gas Emissions Trading Scheme for the United Kingdom".

The UK Emissions Trading Regime applies to all companies operating in the United Kingdom who agree to binding greenhouse gas limits. The regime is overseen by an Emissions Trading Authority, and would include different types of participants. Participants include those who agree to absolute annual emission limits, and those who accept an output-related emissions target, both under a negotiated agreement. Other participants are firms which deliver specific emission reductions projects, and firms who accept an absolute cap on their emissions in return for a financial incentive via the incentive bidding mechanism discussed below. Parties in the first and second category receive permits for CO₂ tonnes equivalent, that would be equal to either an annual emissions limit, or savings on emissions occurring under the agreement, respectively. The targets will either comprise only CO₂, or all six greenhouse gases under the Kyoto Protocol. Projects in the UK or abroad that generate emissions reductions will be allowed to generate credits which could meet their obligations or be traded in the market. At this time, the regime does not apply to electricity generation, though these generators could supply credits from approved projects.

The incentive bidding mechanism is one means for companies to participate in the voluntary UK Emissions Trading Scheme, the other way being through a Climate Change Agreement under the Climate Change Levy package as previously discussed. Through the incentive bidding mechanism, companies can choose to make emissions reductions (tonnes of CO₂ equivalent) in return for government incentive payments (pounds per tonne). Emissions reductions that are paid for from the fund will form company emissions reduction targets. Companies will be able to meet their targets by either reducing their emissions or buying emissions permits from other participants in the trading regime. Companies will also be able to sell or bank emissions permits if they

³⁶ Emissions Trading Group, Outline Proposal for a UK Emissions Trading (May 15, 2000).

reduced further than their targets. The first emissions reduction targets for firms apply in 2002 and annually to 2006, with incentive moneys being paid yearly to companies.

The auction for entry into the UK emissions trading scheme took place from 11 March to 12 March 2002, and was completed successfully after 9 rounds. The auction cleared at a price of £53.37, which is the price the Government will pay per tonne of emission reduction delivered by organisations. 34 organisations won the auction at this price, taking on binding emission reduction targets totalling 4 million tonnes of CO₂ equivalent by the end of the five years of the scheme. This was approximately an 11% average emission reduction. For those entering via the auction, the Government made available the £215million as incentive money for the next five years, though the maximum that any one company can receive is 20% of this amount or £43 million.

Trading began on 2 April 2002, when participating organisations are able to trade allowances to meet their target at minimum cost. Organisations can meet targets by reducing emissions themselves or by buying surplus allowances from another participating organisation. Organisations must meet each of five annual targets in order to earn their share of the Government's incentive pot. Allowances can also be saved for use against future annual targets in the scheme, and a company's own reductions can also be banked beyond the end of the scheme and into the Kyoto commitment period of 2008 to 2012.³⁷

The UK Emissions Trading Scheme must be considered in conjunction with the Climate Change Levy, and the policies and measures for renewable energy and energy efficiency. The Climate Change Levy allows discounts from the tax for designated energy intensive companies that enter into emissions trading, the reduction in tax for meeting targets under the negotiated agreements being discussed above. Government has also proposed trading of Renewable Obligation Certificates. If individual suppliers overachieve their obligations, they will be able to convert their overachievement to CO₂ equivalent and sell it to the emissions trading regime. The Energy Efficiency Commitment is an obligation on licensed electricity or gas suppliers to encourage or assist consumers to take up energy efficiency measures. Government is proposing to allow these suppliers to trade between themselves. There is a separate market from emissions trading for sales of compliance between distributors. However, increases in efficiency additional to the level of the commitments are eligible for the UK Emissions Trading Scheme on the basis of CO₂ savings. Suppliers can not purchase CO₂ permits and convert them to either Energy Efficiency Commitment or Renewable Energy Obligation Certificates.

Eastern Europe

This portion of the remarks introduces three eastern European countries: Poland, Czech Republic and Hungary. It then considers the terms of these countries accession to the European Union. A summary of their energy markets and the status of energy

³⁷ Press release on the website of the UK Department of Environment, Food and Rural Affairs, www.defra.gov.uk/environment/climatechange/trading/auction.htm.

liberalization then ensues. Preliminary remarks consider interactions between the European Union and these countries.

Poland is both the first country to be discussed, and the country most extensively discussed in this paper. It merits this position due to its status as a host country of the ENERGEX 2002 Conference, and the self-sufficiency and evolution of its energy markets. The Polish state is over one thousand years old, and in the sixteenth century under the Jagiellonian dynasty, was one of the richest and most powerful states on the continent. On 3 May 1791 the Commonwealth of Poland-Lithuania ratified its first constitution, which was the second written constitution of Europe. Shortly thereafter, upon being partitioned by Russia, Austria and Prussia Poland ceased to exist for 123 years. The country regained independence in 1918 for 20 years. In 1989, the elections resulted in the defeat of Poland's communist rulers. In 1998, Poland joined NATO and began negotiating its full membership in the European Union.

The 1997 Constitution vests legislative power in the Sejm and the Senate. The 460 Deputies of the Sejm are elected via party lists and serve a four years term. Parties entering the Sejm have to meet a 5% threshold, or 8% for coalitions. The Sejm plays the dominant role in the legislative process and has the right to supervise the Council of Ministers. The second chamber, the Senate can amend or reject laws passed by the Sejm. The President is the supreme representative of the Republic of Poland, and elected for a five-year term of office in direct elections. The President can veto laws, though a qualified majority of the Sejm can override this veto. The Council of Ministers chaired by the Prime Minister is the principal body of the Executive Branch. The Prime-Minister-designate is nominated by the largest parliamentary group and is given a mandate by the President to form a cabinet. The National Assembly elects the proposed Council of Ministers.

The Czech Republic is situated in the geographic centre of Europe and consists of three historical areas , Bohemia, Moravia and the Czech part of Silesia. The Czech Republic is referred to as the roof of Europe since all the rivers which have their source in the area drain into neighbouring countries. The territory of the Czech Republic was historically one of the most economically developed and industrialised part of Europe.

As the only country in central Europe that was a democracy until 1938, Czechoslovakia was among the ten most developed industrial states of the world prior to the second world war. After World War II, Czechoslovakia was affected by the introduction of a Soviet-style Communist regime. The three branches of power necessary for democratic development - executive, legislative and judicial - were substituted by a unified Communist power based on the constitution. For forty years, the Communist Party was the only autonomous political entity. After November 1989, the country faced the task of resuming its pre-Communist traditions and building a democratic political system. A wide diversity of political parties were established even before the break-up of Czechoslovakia on December 31, 1992. The constitution of the Czech Republic, which became valid on the day of the birth of the new state, explicitly defined civil rights, the

relationship between the executive and legislative branches of power, and the independence of the judiciary.

Hungary is a landlocked country, bounded on the north by Slovakia; on the north-east by Ukraine; on the east by Romania; on the south by Serbia, Croatia, and Slovenia; and on the west by Austria. The Danube River forms part of Hungary's north-western border with Slovakia, and then flows south through Budapest, dividing Hungary into two general regions. A low, rolling plain known as the Great Hungarian Plain, covers most of the region east of the Danube extending east to Romania and south to Serbia. Highlands along the northern border of the country extend eastward from the gorge of the Danube at Esztergom and include the Matra Mountains, part of the Carpathian Mountain system. The Danube is Hungary's most important river and transport route, offering easy access to central and south-east Europe.

Since 1997, the Hungarian economy has consistently recorded growth rates of between 4 to 5 percent a year. Since the start of the change of regime, the main trend in Hungary's trade policy is continuous trade liberalization. Among the objectives of Hungary's external economic policy is the further increase of commodities and services exports, the diversification of such exports, the promotion of Hungarian direct investment abroad, including capital investment, and the protection of domestic markets.

Accession of Eastern European countries to the European Union³⁸

For the European Parliament, the fifth EU enlargement is a unique task of an unprecedented political and historic dimensions which furthers the integration of the continent. Thirteen candidate countries are Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, the Slovak Republic and Slovenia and Turkey. Substantive preparedness of the candidates is the overriding principle in deciding on the dates of the entry, as the states must share the values and objectives of the European Union as set out in the Treaties.

Compliance with political criteria laid down at the Copenhagen European Council of December 1993, or the "Copenhagen Criteria", is the starting point for accession to the Union. The conditions governing accession are institutional stability and respect for human rights, the existence of a functioning market economy, the capacity to cope with competitive pressures of market forces and the ability to take on all the obligations of Economic and Monetary Union.

Parliament's most significant power is its assent to the final Treaty of Accession. It is closely monitoring the negotiations and the Commission keeps Parliament informed at all key stages of the accession negotiations. Its Committee on Foreign Affairs is responsible

³⁸ This analysis of the accession of eastern European countries to the European Community is largely based on the following report: Enlargement Task Force, The European Parliament in the Enlargement Process - An Overview (May 2001) (website of the European Parliament).

for coordinating the work on enlargement and ensuring consistency between the positions adopted by the Parliament and the activities of its specialist committees as well as those of the joint parliamentary committees. The constitutional basis for the cooperation between the European Parliament and the Commission is the Framework Agreement on relations between the European Parliament and the Commission, which was signed by the Presidents of the two institutions on 5 July 2000. The national Parliaments will have to ratify the Accession Treaties with any future member states.

The Luxembourg Summit of December 1997 began the enlargement process and opened negotiations. On 31 March 1998, accession negotiations were started with Hungary, Poland, Estonia, the Czech Republic, Slovenia and Cyprus. At the Helsinki Summit on 12 December 1999, Member States decided to open negotiations with Romania, the Slovak Republic, Latvia, Lithuania, Bulgaria and Malta; and negotiations were opened with these countries on 15th February 2000. At this meeting Turkey achieved "candidate" status but no date was set for opening accession negotiations.

The European Parliament insisted on an enlargement strategy with the involvement of all applicants in the accession process. Parliament took the view that each country should be judged according to the progress of its negotiations, and that a flexible process of enlargement would be possible, progressing with negotiations at a pace which is appropriate for each country. On 4 October 2000, an annual debate on enlargement took place, resulting in the adoption of the Enlargement Resolution, which called for a dynamic negotiating process and would allow the citizens of the new member states concerned to participate in the next European Parliament elections when they take place in 2004. The Nice European Council of December 2000 endorsed the strategy proposed by the Commission in its Strategy Paper, and a target date for membership as early as 2004. It insisted that no further obstacle should now be put in face of the enlargement process, endorsed the differentiation amongst the candidates, and confirmed the catch-up principle. It specifically reconfirmed the Parliament's view that the best prepared countries should be able to participate in the 2004 parliamentary elections.

The pre-accession strategy provides support towards the specific needs of each candidate country as it prepares for accession. The key instruments of the pre-accession strategy are: The Europe Agreements, the Accession Partnerships, the National Programmes for the Adoption of the Acquis and the pre-accession assistance instruments. In addition, the candidate countries participate in several European Union programmes. Negotiations focus on the terms under which the applicants will adopt, implement and enforce the acquis, and, notably, the granting of possible transitional arrangements which must be limited in scope and duration. In the negotiations, each candidate country is judged according to the principle of differentiation and on its own merits. This principle applies both to opening of the various negotiating chapters and to the conduct of the negotiations. Candidate states that have been brought into the negotiating process later will have the possibility to catch up within a reasonable period of time with those already in negotiations, if they have made sufficient progress in their preparations. Progress in negotiations must go with progress in incorporating the acquis into national legislation and implementing and enforcing that legislation. The pace of each negotiation depends

on the degree of preparation by each applicant country and the complexity of the issues to be resolved. The insistence by the Commission on the creation of the appropriate administrative capacity by the candidates, as well as on their ability to carry out a realistic legislative programme and their capacity to enforce it, is viewed as the best way to speed up the negotiations without undermining the quality of the enlargement process.

Each applicant country draws up its position on each of the 31 chapters of the EU acquis and engages in negotiations with the member states. Each applicant has appointed a Chief Negotiator, with a supporting team of experts. The European Commission carried out the screening exercise with the applicants, conducts the negotiations and draws up draft negotiating positions for the member states. The Commission also monitors the progress made by candidate countries and checks whether the commitments they made during negotiations have been followed in practice. The Council has requested the Commission to provide detailed annual assessments of the candidate states' progress towards fulfilling the accession criteria.

After, the applicant countries submit their negotiating positions, the Commission then prepares a draft common position and submits it to the Council, which unanimously adopts a common position and decides, unanimously, to open the negotiation chapter. The common positions may be altered in the course of negotiations if the applicants submit fresh information or agree to withdraw a request for a transitional period. The decision to provisionally close a chapter is also taken unanimously by an intergovernmental conference. The European Union may return to a "provisionally closed" chapter in the light of new acquis screened and included in the accession negotiations. Another case when the EU may return to a "provisionally closed" chapter is when a candidate country has not been living up to the commitments undertaken in that particular field.

The general position, which the Union presented to the candidates at the outset of the negotiations, is that transitional measures should be limited in time and scope, and accompanied by a plan with clearly defined stages for the application of the acquis. The Commission's view is that the candidates fully accept the EU acquis relating to the internal market. At the same time, transition periods should be possible in some difficult areas, such as environment, where large investments are needed before the candidates can fully adopt and implement the acquis.

On 8 November 2000, the Commission presented its Strategy Paper to the European Parliament, in which it made a global assessment of the state of the negotiations and proposed a strategy to the member states for the finalisation of accession talks with the most advanced candidates. It emphasised that the progress in negotiations must go hand in hand with progress in incorporating the acquis into legislation and actually implementing and enforcing it. The Commission's enlargement strategy paper of November 2000 and its adoption by the Nice European Council in December 2000 introduced important elements to the negotiation strategy: a proposal to facilitate negotiations by 'setting-aside' chapters with a limited number of remaining problems, to be solved only at the end of the negotiations; and a detailed road map which provides a

clear sequence for tackling the difficult negotiation chapters in the course of 2001 and 2002.

The Commission and the Council define the EU's common positions for enumerated areas, including its position for transitional measures with a view to closing the chapter provisionally. These areas include: free movement of goods, free movement of persons, freedom to provide services, free movement of capital, company law, culture and audio-visual policy, social policy and employment, environment, and external relations.

On 14 December 2000 the European Parliament adopted a Resolution on the outcome of the European Council in Nice. In this first reaction to the results, the European Parliament underlined its "dissatisfaction with the compromise reached at the Nice Council Meeting, which fell far short of what parliament considered necessary to strengthen the Union's readiness for enlargement and its democratic legitimacy. As of 2001, the negotiators will tackle issues such as agricultural reform, structural policy, environmental protection and freedom of movement. There are two major problem areas which will have to be negotiated: transition periods affecting the working of the internal market and transition periods connected with major investment programmes. Where the internal market is concerned, the Commission plans to make sure that the duration and scope of transition periods are as limited as possible.

Considering the accession status on Poland, Czech Republic and Hungary, the European Parliament stresses the importance of Poland becoming an EU member as soon as possible, perhaps recognizing shifting enthusiasm within Poland. While applauding much of Warsaw's progress towards implementing the 'acquis communautaire', Poland is urged to speed up the process. There is also a need to radically restructure the agricultural sector. Parliament also urges the Polish authorities to continue their work on improving the institutional conditions for effective implementation of regional development programmes

The European Parliament recognises that the Czech Republic is one of the front runners, and acknowledges that it has also made significant recent efforts to speed up the process of aligning its legislation with the 'acquis'. However there is still concern over environmental standards, and in particular the potential safety risks posed by the Temelin nuclear reactor. The attempt by the Czech government to postpone its liberalization of the country's telecommunications market by three years is also highlighted as a potential problem.

Hungary's progress towards adoption of the 'acquis' and its steady economic growth was recognized. Organised crime is highlighted as probably the most worrying internal problem. The resolution stresses the need for firm, foreseeable dates for accession to be established as soon as possible. and the need to prevent discrimination against the Roma community. The 'Joint Declaration' on environmental protection was concluded between Hungary and its neighbours to prevent cross-border environmental pollution, although this issue remains a problem, notably in the Danube and Tisza rivers.

Different committees of the European Parliament made comments for accession and internal markets that are relevant for these countries. The Economic and Monetary Affairs Committee noted that the market economy and democracy is a precondition for accession. There is no opting out of the European Monetary Union, and economic convergence is an obligation for all applicant countries. Full participation within the EU, including voting rights, can only occur after compliance with all Treaty provisions. Applicant countries should have exchange rate policies linked to the euro and have examined the challenges and the risks of any partial monetary integration resulting from the increasing use of the euro as a parallel currency. Transitional periods should be introduced for the liberalization of capital movements, in particular for short-term capital movements. The reliability of banking supervision should also be improved.

The Committee on Legal Affairs and Internal Market adopted a report on the rule of law in the candidate countries and its implementation in practice in areas relating to the internal market. The Legal Affairs Committee expressed its concern on the following matters:

- the capacity of candidate countries to cope with competitive pressure and market forces within the Union;
- transitional periods, which are seen as a flexible and appropriate instrument for avoiding convergence problems, particularly as regards the free movement of workers and services;
- the direct link in the internal market between granting fundamental freedoms and compliance with minimum standards, e.g. in the fields of social security, the environment, consumer protection, etc.;
- the progress made in adapting the legal systems of the candidate countries and call for a permanent effort in this area;
- the adoption of community law when it is effectively enforced on a regular basis by administration, legal controls, market supervision, etc. The committee is very concerned about this area, which should be ready before accession takes place;
- a functioning judicial system with independent courts as one of the essential preconditions for the candidate countries' entry into the internal market;
- the importance of the Copenhagen criterion of 'guaranteeing the rule of law' which rules out any discrimination against EU citizens through laws currently in force.

Eastern Europe

Poland is by far the largest energy producer of the if one considers Czech Republic and Hungary. Poland is not only the largest energy producer but also has the highest level of self-sufficiency. In 1996, the three countries had self-sufficiency rates above the EU, but the differential was not very great. Between these countries and the EU, there are clear differences for energy efficiency and energy consumption. When total primary energy per unit of gross domestic product is measured in purchasing power parity, much lower figures may be produced for these countries which are closer to the EU values, the reason being that the EU has a significantly higher per capita gross domestic product. Even with much greater energy efficiency in some cases, the EU has similar per capita consumption rates as these countries.

With regard to CO₂ emissions for primary energy supply, there are also differences between the EU and these countries. Overall, levels for CO₂ emissions are significantly higher for these countries with the exception of Hungary. This higher level of emissions is due to the greater use of coal and other hydrocarbons. The clearly higher figures in Poland and the Czech Republic demonstrate that in these countries there is a low level of energy efficiency or a significantly higher use of coal, with the associated consequences for the CO₂ output per capita.

Laws, secondary legislation, market rules and grid codes for many eastern European countries are being adopted to provide a structure under which markets can develop and operate. Many countries have either adopted government decisions or legislation to encourage market development. Similarly, regulators are given authority for the structuring the transition from previous to a competitive market structure, including recognizing a role for the regulator in developing market rules and licencing of market operators.

Poland energy markets and liberalization³⁹

In September 1996, Poland first approved guidelines for implementing reforms in the energy sector. These guidelines establish an energy regulatory authority and allow third party access to the Polish electricity transmission grid. The objective was to create a competitive energy market through the privatization of the energy industry, and to attract the investment necessary for industrial modernization and environmental protection. While emphasis is placed on the increased use of oil and natural gas, coal remains the dominant fuel, particularly for the electric power sector.

Poland's Energy Law went into effect in December 1997. Under the law, large electricity users can negotiate directly with generators of power. The Polish Power Grid Company, or Polskie Sieci Elektroenergetyczne (PSE), is obliged to provide transmission for the buyer and seller if it is technically feasible. The remainder of the electricity is sold under agreements that PSE signed with 35 power plants from 1994 to 1998. In December 1999, the Gielda Energii S.A. was established to set up an energy exchange in Poland. It is a consortium of several energy companies, including Endesa of Spain. The Polish energy exchange started operation on July 1, 2000. The schedule for phasing in third party access to electricity and natural gas started with the largest users and will eventually cover all customers by the end of 2005. The natural gas timetable follows a similar pattern.

Oil product pipelines and crude oil storage in Poland are run by the Oil Pipeline Exploitation Enterprise (PERN), a joint stock company wholly owned by the State Treasury. The Polish government has considered privatizing PERN, and if privatized, it would be expected to attract investors as it is one of the most profitable enterprises in

³⁹ Information on Poland, unless otherwise noted, is derived from a Country Overview provided by the US Department of Energy, under the supervision of Richard Lynch, and last updated on February 22, 2002.

Poland. Oil shipments via railroad tank cars are handled by a separate company, DEC., which transports 14 million tons of products annually.

Polish Oil and Gas Company (POGC) is responsible for construction and operation of gas transmission and distribution system, and has a well-developed natural gas transmission system for supply of the increasing number of its customers in Poland. The number of residential and commercial gas customers is about 6.8 million, and the transmission and distribution network is 107,000 kilometers. By 2010, Poland expects to add 43,000 to 58,000 kilometers of new distribution pipelines. POGC constructs and operates underground gas storage facilities in Poland. There are seven underground gas storage sites available, and POGC also leases storage capacity in the Ukraine and Belarus.

POGC's privatization process will occur over the next few years, and include POGC's pipeline network as well as its upstream gas production and storage facilities. The first step was the division of POGC into six different entities: four regional gas distribution companies, a company to handle gas production and storage, and the "mother" company (POGC) which would import and market most of the gas consumed in Poland.

Despite concerns over energy dependency on the Russian Federation, larger imports of Russian natural gas will occur via the Yamal-Europe Transit Gas Pipeline which is being constructed across Poland and western Europe. The Yamal pipeline is expected to cost \$35 billion, and will transport 13 billion cubic meters of natural gas annually into Poland. It is expected that the entire project will be completed in 2010. POGC has also signed an agreement with the Danish Natural Gas Company to build a natural gas pipeline across the Baltic Sea which would carry 10 billion cubic metres annually.

In 1999, Poland began to privatize companies involved in the production and distribution of electricity. This privatization plan involves selling shares in electric generating and distribution companies to investors. The electricity industry has been reorganized into three layers of companies dedicated to the generation, transmission, and distribution subsectors. The generation subsector consists of large power stations and combined heat and power facilities. Generating capacity is expected to be adequate for the next several years, due to lower economic growth and transition to a less energy-intensive economy. The Polish electric power sector needs to replace 16 gigawatts of obsolete installed capacity and to satisfy stricter environmental standards, and a substantial portion of the modernization cost will be covered by the privatization.

Once part of the POKOJ power distribution system, which was the former power distribution system of the Ukraine and Eastern European countries, CENTREL (the new power distribution system of Poland, the Czech Republic, Slovakia, and Hungary) is fully integrated into the Western European UCPTE system. Poland also maintains very strong links with distribution systems in the Ukraine and Belarus. These links provide Poland with an exchange potential with Western Europe and these former Soviet Union states. As of the year 2000, the Polish power grid consists of about 200 kilometers of 750 kilovolt (kV) lines, about 4,700 kilometers of 400 kV lines, and about 7,900 kilometers of 220 kV lines, and is interconnected using more than 80 large substations.

The Polish Power Grid Company - Polskie Sieci Elektroenergetyczne (PSE) - was created in August 1990 by the Polish Ministry of Trade and Industry as a joint-stock company, wholly-owned by the Polish state treasury. PSE is the owner of Poland's high voltage electricity grid and is responsible for grid operations and power dispatching. The distribution subsector consists of 33 distribution companies, all of which are joint-stock companies, and utilizes 110 kV, 15 kV, and 0.4 kV lines to supply electricity to customers. Distribution companies represent approximately 40 per cent of all Polish electricity sector assets.

General rules for competitive markets for gas and electricity are contained in the Energy Law, with secondary rules for tariff, connections and non-conventional energy source being found in ordinances of the Ministry of the Economy. The Electricity Regulatory Agency is authorized under law to licence and set prices for monopoly activities.⁴⁰ The privatization process in Poland falls under the Council of Ministers, with the Minister of the Treasury having the legal authority and obligation to prepare yearly programs of privatization of state-owned assets and to manage those programs approved by the Council. The Regulator has played a supportive but background role in the Polish privatization process. The Ministries of Treasury, Economy and Finance first adopted a plan for the electricity market in 1999. In December 2000, the framework of that market was introduced in the policy document, "Operational Rules for the Polish Electricity Market for the Year 2000 and Beyond."

The Polish Power Grid Company operates as a transmission system operator. Its primary activities are power dispatch, the operation of a national power system, power transmission through a high voltage system, generation of electricity, trading in electricity and energy system services both nationally and internationally, and developing a national electricity system through planning and research.⁴¹ The Energy Law guarantees third party access for energy producers within Poland, but does not provide this guarantee for external parties, though this is likely to change as a result of EU requirements. New transmission tariffs are being prepared for the Polish Power Grid Companies and distribution companies.⁴²

A Power Exchange has been designed but only small amounts of electricity are sold there, in the range of 3 per cent. The Power Exchange was established without specific legislation, and is a joint company with shares held by the State Treasury. Prices on the exchange are exempt from approval by the Energy Regulatory Agency. The exchange operates a day ahead market, where distribution companies and large customers bid the price at which they will buy, and generators and wholesalers bid a price at which they

⁴⁰ Licencing/Competition Committee, Energy Regulatory Regional Association, Electricity Market Development and Market Contractual Arrangements in the USA, the EU Members and in the Member Countries of the ERRA (2001), p. 27.

⁴¹ Ibid, p. 35

⁴² Ibid, p. 45

will sell supply. A clearing house price is then established for each hour of the subsequent day. Bilateral short and long term contracts are also permitted, and are the majority of the market.⁴³

The Energy Regulatory Agency may have some problems in promoting market development because of pre-existing long-term energy contracts for the delivery of electricity. Although these contracts have facilitated financing equipment, they have complicated the development of competitive markets, and there is a concern that long-term contracts might interfere with the establishment of a Power Exchange. Specifically, most energy is sold pursuant to the long-term contract and very little energy is available to trade on the Power Exchange. Further, such long-term contracts might be used to effectively exclude other future potential entrants into the market.⁴⁴

The restructuring of Poland's downstream oil industry began in 1994 with the establishment of Nafta Polska, the joint stock holding company for Poland's oil industry, which is ultimately responsible for the privatization of Poland's oil and gas sectors. Nafta Polska is comprised of Poland's two major refineries, five smaller refineries, and the Central Distribution Company (CPN). At the end of 1996, CPN was to be divided into three companies: CPN (the gas station company), DEC Ltd. (the railway tank company), and Naftobazy Ltd. (the oil storage company). Poland's downstream petroleum sector consists today mainly of PKN Orlen, which is the Plock refinery and the former CPN Gas station network, and the Gdansk refinery. Gdansk is to be sold by Nafta Polska and PKN Orlen might be the buyer.

Environmental impacts from energy production are a major concern. Energy-related environmental problems include air pollution from burning coal in power and district heating plants, water pollution from coal mine dumping of saline water into the Vistula and Oder rivers and refinery effluents of insufficiently treated water, and solid waste from coal mines and power plants. Poland's three largest coal mines are among the largest sources of pollution.

Large power plants and combined heat and power facilities have been equipped with high stacks and electrostatic precipitators, or at least bag filters, allowing for the capture of increasing amounts of fly ash particulates. Flue gas desulfurization and low-NOx technology were only introduced in the 1990s. Because of this, and the use of lower sulfur coal, the environmental performance of many power plants has improved considerably. However, under environmental regulations adopted in 1990, new emission standards for existing plants came into effect in 1998 that are in line with EU standards. Additionally, all plants will need low-NOx burners and improved fly ash particulates removal.

⁴³ Ibid, pp. 4 and 40

⁴⁴ Regional Energy Regulatory Program for CEE/ Eurasia, Tariff/Pricing Committee Final Issue Papers, Privatization and Regulatory Control: Integrating the Regulatory Agency into the Overall Regulatory Framework (2001).

The Energy Regulatory Authority has indicated its intention to put more emphasis on the spot market for short term contracts for electricity and less emphasis on long term contracts. At the present time, it is not clear how this policy change will be implemented. If the balance shifts to short term contracts, this might tend to favor new generation sources, municipal combined heat and power, and "green" power sources that have a legally privileged status. Poland has signed a number of international agreements and accords on the environment, including adopting all obligations from the Convention on Climate Change, as well as other agreements to control transboundary emissions.

Czech Republic energy markets and liberalization⁴⁵

The Czech Republic has an energy strategy that includes market energy prices; state-owned energy enterprises being restructured and privatized; the production of safer, more efficient, and less polluting forms of energy; the encouragement of energy conservation; increased and diversified connections to international oil and gas pipelines and electricity networks; and more efficient domestic oil and gas production. The Czech government is focusing on harmonizing Czech energy sector standards with those in the EU. This means decreasing Czech dependence on solid fuels as a primary energy source. Coal will gradually be replaced as a source of heat, or will be increasingly used for co-generation. Improvements are also planned for legislation, business conditions, statistics and reporting standards in the energy sector to conform Czech standards with those of the EU.

On 1 January 2001 a new energy regulatory authority began operating in the Czech Republic. Its responsibilities include determining rates that customers will pay for energy and setting up the framework for third party access to the electrical grid. The schedule for phasing in third party access to electricity starts with the largest users and will eventually cover all customers by the end of 2006. The natural gas timetable will follow a similar pattern with the largest customers getting access first. Transgas, the Czech gas pipeline utility, will phase out its subsidies to customers in 2003. Another new energy policy change enacted into law at the beginning of 2001 is the requirement that energy audits be performed by the end of 2003.

Energy audits by government-approved auditors are now mandatory for all government facilities with energy uses of more than 1,500 gigajoules per year. Energy audits are also required for non-government energy users, but the threshold is much higher as any energy user who consumes at least 35,000 gigajoules per year must have an energy audit. The purpose of these audits is to encourage energy conservation and also outside investment by energy services companies for making any economically-feasible improvements in energy usage. Oil policies are part of the Czech Republic's bid to be admitted to the EU, particularly building a 90-day state oil reserve. In 2001, the EU

⁴⁵ Information on the Czech Republic is derived from a Country Overview provided by the US Department of Energy, under the supervision of Tara Billingsley, and last updated on November 15, 2001.

agreed to the Czech Republic's request to extend the deadline for building this reserve to December 2005.

The electricity transmission system in the Czech Republic includes an extensive array of transmission lines and substations. It consists of approximately 1,750 miles of 400 kilovolt (kV) lines and approximately 975 miles of 220 kV lines. Additionally, approximately 80 miles of 110 kV lines supply electricity to a well-developed 110 kV network. The electricity transmission system is highly interconnected with the transmission systems of all neighboring countries. The Czech Republic is a member of the CENTREL association along with the Slovak Republic, Poland, and Hungary, which has synchronized interconnections with the Western Europe UCPTE System

The Transgas System is the only system that transports natural gas to Western Europe through the Czech Republic. Although spare capacity exists during non-peak months, almost all capacity is utilized during winter peak demand periods. The Transgas System also provides gas to Germany, France, Italy, and Austria. There are approximately 32,000 miles of pipelines across the Czech Republic, including about 2,500 kilometers for international transport Russian gas toward Western Europe. In November 1999, a long term contract was concluded between Transgas and Gazexport for the long term transit of Russian natural gas across the Czech Republic until 2020. Under the terms of the deal, 28 billion cubic meters per year will be transported through 2008, and, after 2009, the guarantee drops to 13 billion cubic meters annually. This reduction anticipates the completion of the Yamal gas pipeline across Poland which will bypass the Czech Republic and Slovakia. There are six underground storage facilities for natural gas in the Czech Republic that have a cumulative capacity of about 72.3 BCF.

The Czech Republic receives most of its crude oil supplies via the Druzhba (Friendship) Pipeline from Russia and the Mero Pipeline from Germany. Other pipelines include the Adria Pipeline (oil) and the Brotherhood Pipeline (gas). The Druzhba Pipeline, historically the main source of oil, has a capacity of 73 million barrels per year. The completion of the Mero Pipeline from Germany, which connects to the Transalpine Pipeline to Trieste, provides the same capacity as the Druzhba. This allows the Czech Republic to diversify its supply and reduce dependence on Russian oil. The trend over the years is expected to be more Western oil and less Russian oil.

The Czech Republic maintains a sophisticated power system, and serves as a major supplier of electricity in Central Europe. The dominant electricity producer in the Czech Republic is Ceske Energeticke Zavody (CEZ). As of the end of 1999, the installed generating capacity of CEZ was 10,151 MWe, with approximately 2,000 MWe of additional capacity slated to come online when the Temelin nuclear power plant begins operation.

The process of restructuring of energy companies in the Czech Republic is unique. Although all major energy enterprises have been converted to joint stock companies, many are still state owned. In other cases, shares in newly-formed companies have been sold to both foreign and Czech investors. Privatization of the refining industry resulted in

selling of formerly state-owned refineries to a consortium of Royal Dutch/Shell, AGIP, and Conoco. In January 2002, the Czech government signed a contract to sell Transgas, the state gas company, to RWE Gas of Germany. The privatization of CEZ and the eight electricity distribution companies is the focus of current negotiations. The Czech government has plans to privatize CEZ by selling the entire company to one buyer, including both the generation and transmission facilities. Privatization of district heating utilities is not a current concern of the Czech government, with privatization responsibility being transferred to regional district heating companies.

In 1999, the Czech Republic consumed approximately 53 Gigawatt-hours (GWh) of electricity while generating approximately 61 GWh. Electricity consumption is projected to steadily rise, much of which is expected to be from increased demand from small-scale consumers, primarily households. CEZ produces more than three-quarters of the electricity generated in the Czech Republic, handles import and export of electricity, and presently also operates the 220 kV and 400 kV grids via its CEPS subsidiary. Most of CEZ's electricity is sold to the eight regional electricity companies in the country, who then sell to customers. In addition, CEZ also sells electricity directly to six large industrial customers. The independent power and heat company is Elektrany Opatovice, which owns and operates two major power plants and sells power to the CEZ grid under a negotiated contract. As of December 1999, CEZ owned and operated ten large coal-fired power plants, one nuclear power plant, 14 hydroelectric facilities, and one very small windpower facility, as well as the Czech high voltage power transmission grid.

Czech power system development efforts in the 1990s were focused primarily on substantially reducing air pollution from coal-fired power facilities. These included: the gradual decommissioning of obsolete power units, upgrading units selected for continued operation by installing fluidized-bed boilers or scrubbers, and completing two nuclear units at the Temelin facility. These efforts were successful, by the end of 1999, in 'desulfurizing' all coal-fueled power plants under operation by CEZ. The decommissioning of obsolete power units was facilitated by a decrease in electricity demand. The majority of decommissioning is in fossil-fuel powered plants. The loss of generating capacity from fossil fuel power plants will be more than offset by increases in nuclear and hydroelectric capacity.

Over the past decade, the Czech Republic has seen a dramatic downward trend in its emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulates, carbon monoxide (CO), and non-methane volatile organic compounds (NMVOCs). The energy sector, in particular heat and power generating plants, is the main source of air pollutants, accounting for approximately 82% of SO₂ emissions, 21% of NO_x emissions, and 55% of total particulates released into the atmosphere. The Czech Republic has placed a major emphasis on reducing harmful emissions from coal-fired power generation, and in particular, CEZ has been very proactive in modernizing its fossil-fueled power plants to reduce the amount of NO_x and SO₂ emissions from electric power generation. This has resulted in a dramatic reduction in atmospheric NO_x and particulates of more than 50% and 90%, respectively, as compared to corresponding 1991 levels. Finally, older fossil-

fueled units are scheduled for decommissioning once Temelin nuclear power plant comes online; about 2,000 MWe of older coal-fueled generating capacity will be affected.

The Czech Republic has signed a number of international agreements and accords on the environment, including adopting all obligations from the Convention on Climate Change as well as other agreements to control transboundary emissions.

Hungary energy markets and liberalization⁴⁶

Hungary's economic reforms during the communist era gave it an advance on the privatization process, particularly for attracting foreign investors. Hungary has accounted for about half of all foreign direct investment in eastern Europe since 1989, and overall, about half of the gross domestic product originates in the private sector. The Hungarian government has an energy policy to develop diverse energy supplies and eliminate dependency on imports from the former Soviet Union; improve environmental protection; increase energy efficiency through modernization of supply structures and better management of electricity consumption; and attract foreign capital for investment in capital-intensive energy projects. Hungary's energy policy is also oriented toward achieving EU accession. The 1999 energy plan issued by the government indicates a movement toward cleaner technologies, including emissions controls for coal-fired generation and eventual replacement of some coal-fired power plants with gas turbines. Hungary is expecting accession to the European Union by 2004, and the adoption of EU energy directives is of great importance.

The Hungarian government is liberalizing the electricity and natural gas markets. An energy law which was to be enacted by 2001 should go into effect at the beginning of 2003. The Hungarian Energy Office was created in the early 1990s in anticipation of the changes that are now occurring. The Office is responsible for licensing for producers of gas and electricity. It determines but does not set tariffs for third party access to electricity, gas, and district heat transmission systems, and is the lead organization for consumer protection and investigation of any complaints. One of the Energy Office's main activities is handling market-related problems.

There will be a gradual introduction of competition to the electricity market. In 2003, the largest industrial users, constituting about 35 per cent of total consumption, will be allowed to choose their electricity suppliers. Third party access to the grid will begin then, and independent power suppliers will be allowed to "wheel" power through the grid, though the grid operator will be allowed to add a transport and access tariff. One effect of this liberalization plan is the creation of two parallel markets for electricity. The transitional public utility market will still have an official price for electricity, with the Hungarian national electricity company, MVM, as the wholesaler. This will cover the 65 per cent of the market not initially affected by the first stage of market liberalization, and

⁴⁶ Information on Hungary is derived from a Country Overview provided by the US Department of Energy, under the supervision of Richard Lynch and dated February 25, 2002.

will gradually diminish as the competitive market expands. The public utility market should entirely disappear no later than 2010.

The privatization of electricity sector generating and distribution companies is mostly finished. Privatization of the MVM, which plays a determinant role in the electricity sector, the MVM-owned Paks Nuclear Power Plant, and the National Grid Company will begin later. Privatization of the Hungarian Oil and Gas Company (MOL) has taken place mainly from acquisition of shares by institutional investors, both international and within Hungary. MVM has created a new company, MAVIR, which will handle electricity dispatch and balance for the grid. MVM itself will still own the grid and collect the revenues from its use. MAVIR is a 100%-owned subsidiary of MVM, though once it is operational the ownership is supposed to revert to the Ministry of Economic Affairs. MVM will also create, as part of its privatization, separate electricity trading, wholesaling, and transmission companies.

Preliminary plans call for a major changeover from coal power plants to gas turbines over the next three or four years. Under these plans, there would eventually be only one coal power plant left, the Matra plant in the north of Hungary. This is a lignite mine-mouth plant that currently produces 13% of Hungary's electricity. It is estimated that changing a 200 megawatts (MWe) plant from coal to gas turbines takes two years and costs \$60-\$80 million for the equipment. Under Hungary's policies, the cost of rehabilitating the land previously used for coal mining for a plant will be included in the price of electricity. Integration of steam coal-producing mines to power companies mostly took place prior to the first wave of privatization, in 1995.

Domestic energy production (from oil, gas, nuclear power, low calorific coal and lignite) meets approximately half of Hungary's energy requirements. The remaining energy need is met from oil imports. Domestic oil production has peaked, so when energy consumption begins to rise, dependency on oil imports will also likely rise. Hungary relies heavily on the Russian Federation to meet its oil import needs. The main pipeline for Russian oil runs westward through Ukraine; a secondary pipeline that has a lesser capacity and provides source diversification runs through Croatia, connecting with the oil terminal in the Adriatic Sea. By 2010, oil production is estimated to be approximately 15,000 b/d while consumption is expected to increase on average by 3.8%. This increased demand is expected to be for light petroleum products, particularly gasoline and jet fuel.

The Hungarian Oil and Gas Company (MOL) is one of central Europe's largest integrated oil and gas companies, and is the largest company in Hungary in terms of sales. It recently acquired a 36% stake in the Slovakian oil refining company Slovnaft, and expects to increase its share to 50% in the relatively near future. MOL's domestic oil fields are expected to decline in production rate by about 6-9% annually, so MOL has formed a production sharing agreement with the Russian company Yukos for joint development of the Zapadno-Maloblyk field in Siberia, which contains an estimated 175 million barrels of proven reserves. MOL also has exploration activities underway in Yemen, Pakistan, and Syria.

Natural gas reserves are about 3.4 trillion cubic feet. In 1998, natural gas production was 137 billion cubic feet. To meet the domestic demand of approximately 433 BCF, Hungary imports natural gas from the Russian Federation. It is estimated that natural gas production in 2010 will decline approximately 109 billion cubic feet, while natural gas demand is expected to increase to approximately 520 billion cubic feet. Hungary's underground gas storage capacity is well developed; storage accounts for 120 days of peak winter imports. Natural gas storage capacity has expanded at a rate greater than demand growth. As of 1996, nine companies were licensed as natural gas suppliers and three were licensed as liquefied natural gas suppliers.

Natural gas transmission is run by MOL. Currently, there are 65,000 kilometers of gas line in Hungary. Of these, MOL operates about 5,200 kilometers of high pressure lines, which deliver gas to customers. New compressor stations were recently constructed to reach gas markets south of Hungary. MOL has about 3.2 billion cubic meters of underground gas storage capacity available, and there are four underground storage sites. MOL is also the only gas wholesaler. MOL sells 76 per cent of its gas to nine distribution companies and the remaining 24% directly to large industrial companies. Sales to the nine distribution companies are covered by long-term agreements. In October 2000, MOL accepted a proposal that its gas transmission, storage, and trading operations be unbundled into separate entities. Hungary has gradually raised industrial and household natural gas prices removing subsidies, and a full liberalization of natural gas prices is expected for 2005.

Hungary has one nuclear power plant, located near the city of Paks . Hungary's nuclear industry, which provides a significant percentage of the domestic energy needs, is dependent on enrichment and processing facilities primarily within the former Soviet Union. EU safety experts have indicated that Paks is as safe as western nuclear power plants and will comply with EU standards by 2002. Paks has had an excellent safety record and has been ranked in the top 10 percent of reactors worldwide. Regulation of nuclear safety is under the Hungarian Atomic Energy Authority, which serves as the operating body of the Hungarian Atomic Energy Commission.

Hungary has limited hydroelectric potential. There are only three small commercial hydroelectric power plants in the country. The new owner of the small Hernádviz power plant is the Hungarian subsidiary of the German company Innoventa Energy AG. Hungary's first wind power plant is a small facility located near the Danube River about 40 miles south of Budapest. Hungary has electricity high-voltage transmission lines of 750 kilovolts (kV), 400 kV, and 220 kV; which are 270, 1,730, and 1,200 kilometers in length respectively. There is also a 120 kV grid which is directly supplied by many of Hungary's power plants, including the Paks nuclear power plant. The main power transmission line linking Hungary to the east is a 750 kV line from Ukraine. In recent years, the Hungarian power system has become integrated into the power system of Western Europe. The connection of the Hungarian system to the West-European UCPT system was completed in 1995. A 400 kV interconnection was put into operation between Hungary and Croatia in November 1999.

Of the 49 power generating units (of all types) in the Hungarian power system, only 16 have installed capacities greater than 100 MWe. Those 16 units represented 94% of the total capacity in 2000. The total installed generating capacity in Hungary at the end of 2000 was 8,282 MWe. Electricity demand in 2005 is estimated to be from 42 billion kilowatt-hours to 54 billion kWh. In 1990, Hungary had imported 12.2 billion kWh per year from Ukraine. However, by 2000, the net imports from Ukraine had shrunk to 1.54 billion kWh per year, as Hungary integrated its electric transmission with its Western neighbors. In 2000, Slovakia was Hungary's main source of imported electric power with 7.55 billion kWh per year in electricity purchases.

Until 1992, the electricity industry was managed by the Hungarian Power Company -- Magyar Villamos Művek Reszvenytársag (MVM). In 1992, Hungary reorganized MVM into a two-tier company structure. The upper tier, which remained MVM, manages all trade in electricity. MVM owns and operates the high voltage transmission grid and dispatching center. It purchases power from electricity generating companies and sells it to smaller distribution companies. MVM controls the financial flow of electricity-based goods and services by the use of tariffs. It also manages all electricity-related import and export transactions. The second tier of the utility system is comprised of several independent generating companies; six regional distribution companies; and one maintenance company for the basic network.

The majority of the power companies in Hungary are now the property of investors, rather than the Hungarian government. However, the Paks nuclear power plant and the National Power Line Company are owned by MVM, the state-owned utility. The role of MVM is the control of the power system, electricity transmission, wholesale sales, imports, and exports. MVM buys electricity from the power plants and import sources and sells it to the distribution companies. When the generating companies were privatized in the early 1990s, the power plants were privatized in package deals with their associated coal mines.

Air pollution is the most significant environmental issue facing the energy sector. Approximately 44 per cent of the Hungarian population lives in areas that do not comply with national air quality standards. A significant contributor to air pollution is abundant use of high sulfur, low calorific value, domestic coal and lignite, which are major sources of sulfur dioxide (SO₂). However levels of oxides of nitrogen (NO_x), particulates and carbon monoxide (CO) are also of concern. Although many power plants are equipped with electrostatic precipitators, the effectiveness of these systems vary considerably. Wastes from open pit and deep coal mining are also of concern, particularly as a growing number of mines are being closed and clean-up responsibility is unclear. Water pollution from industrial activity is a significant problem along the Danube and Tisza rivers.

Hungary has signed a number of international agreements and accords on the environment, including the Convention on Climate Change which was signed and ratified; as well as other agreements to control transboundary emissions.

Interactions between the European Union and Eastern Europe

These remarks conclude with some preliminary observations on interactions between the European Union and eastern European countries on energy and related environmental matters. As mentioned previously, the energy markets of member states of the European Union are liberalizing, albeit unevenly, in response to the Directives and policy papers. The internal energy market is also developing at the same time as national and continental requirements for renewable energy and energy efficiency are being implemented.

Environmental measures for energy are being implemented to meet immediate and local environmental goals, and in part to satisfy the EU and member states' obligations under various directives and the Kyoto Protocol. Emissions trading regimes are also being considered in close proximity to energy liberalization and the regulation of energy markets. Therefore and as it develops and evolves, energy liberalization, environmental measures, and any emissions trading regimes in the European Union are likely to be consistent.

The economies and political regimes of eastern Europe are in a period of rapid change since the end of communism. Energy liberalization is one aspect of that change, though it is being hastened by external factors. In order to meet requirements for accession to the European Union, Poland, the Czech Republic and Hungary must comply with the requirements of the European Community. Arguably, some of the most important requirements will be for internal markets that are open, transparent and competitive; for institutions and processes that are democratic and comply with the Rule of Law; and for energy and related environmental measures.

It has and remains difficult for member states in the European Union to comply with all directives, policies and requirements for internal energy markets and related environmental measures. Given the difficulties experienced even by EU member states, it is difficult to gauge whether eastern European countries like Poland, Hungary and the Czech Republic will be able to substantially comply with EU requirements for internal energy markets and environmental measures for 2004. These eastern European countries may have additional difficulties given the recent and extensive changes to their economies and political structures, and concerns for transparency and governance. Additionally, political support for accession to the European Community may vary over time.

In the same fashion as the EU, energy liberalization is occurring in Poland, Czech Republic and Hungary while environmental measures are being introduced. Though energy markets may be at an earlier stage of evolution in these eastern European countries, energy liberalization, environmental measures and emissions trading regimes could be consistent. Given the requirements of accession and requirements, energy and environmental measures in these countries will be consistent with measures in the European Community.

A subtle potential challenge for the European Community and accession countries such as Poland, Czech Republic and Hungary is the maintenance of the political and economic will to implement regional energy markets. More explicitly, there is the challenge of designing environmental measures and emissions trading regimes that facilitate competitive energy markets. Energy liberalization requires active market participants for the generation, distribution and sale of energy. Similarly, emissions trading regimes must be sufficiently attractive to encourage the active participation of private parties, administrators, and financial markets.

Interestingly, North America has an opposing paradigm. Despite the bankruptcy of Enron, energy markets remain attractive to market participants and investors. However, and irrespective of recent political positions for the Climate Change Convention, it is difficult to introduce environmental measures supporting renewable energy and energy efficiency, or emissions trading regimes, due to the structure and operation of these energy markets.

For Europe as a whole, it is interesting to consider emissions trading regimes in the context of an expanded European Union, or the implications of Poland, Czech Republic and Hungary being parties to the Kyoto Protocol. The European Union has agreed to honour the Kyoto Protocol, though implementation has not occurred evenly and consistently throughout the member states. Policy documents for the European Community contemplate the possibility of a gradual extension of the EU emissions trading regime as new member states enter the European Union, or with countries who are part of the European Economic Area. Given the state of energy production, transportation and consumption in eastern Europe, and potential lower costs associated with reductions in greenhouse gas emissions, it might be logical for the first implementation measures to occur in this region, and specifically in accession countries. It may be useful to consider how to best to implement emissions trading and other flexibility mechanisms between the EU, its member states, accession countries, and throughout eastern Europe.