Energy in Central and Eastern Europe: Progress and Challenges

*By Guy Caruso and Erich Unterwurzacher**

Since the collapse of the communist regimes in central and eastern Europe and the Soviet Union in the late 1980s, transition economies have progressed at varying paces in modernizing and restructuring their energy sectors. Many countries have managed to stabilize their economies, which have undergone a significant decline in GDP during the first half of the 1990s. Some countries have done so surprisingly quickly, but others lag behind or have experienced setbacks in recent years.

Most transition economies still need to undertake major efforts to develop open and efficient energy economies that are able to cope with the challenges of today's global energy markets. The success of energy sector reform crucially depends on continued efforts to further liberalize energy prices, to establish an equitable and transparent legal framework, to increase private participation in the energy sector and to foster entrepreneurial initiative. These issues remain as important as they were in the early years of transition.

Economic Performance is Promising

Economic growth is resuming in central and eastern Europe (CEE)[1] and the former Soviet Union (FSU) in 1997 after seven years of continuous decline in measured GDP. Six economies in CEE are now growing at rates of 4 percent or more. In 1995 and 1996 the Polish and Slovak economies grew by about 5 percent, more than twice the rate of the European Union (EU). However, in some countries in eastern Europe growth has slowed for the third year in a row, with Albania, Bulgaria and Romania experiencing sharp setbacks. Bulgaria and Romania still have substantial tasks ahead to stabilize their monetary and fiscal regimes. Economic contraction has ended in the FSU. Preliminary estimates for Russia indicate that 1997 recorded modest growth for the first time since 1990.

Successful macro-economic consolidation is also reflected in a substantial decline of inflation and stabilization of unemployment. Inflation performance has continued to improve despite several setbacks. With the exception of Bulgaria inflation in the region declined from the high two digits in the early 1990s to around 10 percent. The persisting high levels in Bulgaria and to some extent in Romania are of particular concern – in Bulgaria inflation was close to 600 percent in 1997.[2]

Recognizing the success in overcoming the difficulties of economic transition and the efforts in modernizing capital markets and fiscal regimes, the most advanced transition economies (the Czech Republic, Hungary and Poland) have already been admitted to the OECD.

Energy Demand Started to Grow Again in 1995

Due to the economic collapse, energy demand in CEE had declined by more than 25 percent in 1994 compared with its 1987 peak. In 1995, energy demand began to grow again, at about 3.3 percent for the region as a whole. Preliminary data for 1996 indicate a further growth of around 4 percent.[3] Contrary to the developments in CEE, energy demand in the FSU declined in 1996, falling about 2.6 percent.

There are also structural shifts within the composition of energy supply leading to a declining share of coal and growing demand for natural gas – in power generation and households – and oil, in particular for transport fuels. In the most advanced CEE countries demand for transport fuels has grown at about 10 percent a year since 1994. Electricity demand is also expanding strongly as countries restructure their industries. In 1996, electricity demand was close to its previous peak recorded in 1988.

Reduced coal use has led to significant improvement of local and regional air quality, in particular regarding sulphur dioxide emissions and particulates. With respect to global environmental concerns, the contracting energy demand had also significantly reduced the CEE region's CO_2 emissions. In CEE, CO_2 from fuel combustion declined by about 20 percent during 1990 to 1995.[4]

Policymakers will need to pay attention to the implications that oil and electricity demand growth will have on energy security, the environment and infrastructure investment. The surging electricity demand, for example, together with the shut-down of coal-fired power plants is leading to increased reliance on nuclear power plants, which in some countries are of Soviet design and are considered of higher risk than those in OECD countries.

Energy Intensity Gap Has Narrowed But Is Still Substantial

The combined effects of raising energy prices, economic restructuring and accelerated turnover of capital stock has improved energy efficiency. Nevertheless, the efficiency gap between western and eastern Europe remains significant. Although the comparison of energy intensities at an aggregate level is prone to misinterpretation, available information indicates that transition economies are using energy much more inefficiently than western European countries. The main reasons are an aged and inefficient capital stock in industry, high losses in energy production, transmission and distribution systems, the relative importance of energy-intensive industries and inefficient energy use in the building sector. If calculated as primary energy supplies per unit of economic activity, energy intensities in 1995 in CEE were about twice as high as in western Europe.

Economic prosperity is a driving force to enhance energy efficiency. It is evident that energy efficiency improvements have been disappointing and measures to enhance efficiency as yet have achieved only limited results. Only those countries which have experienced several years' economic growth have witnessed declining intensities. In the Czech Republic and Poland, respectively, intensity declined by 8 percent and 17 percent between 1991 and 1995. Policymakers are called on to act more swiftly – most importantly on price reform – so that this largely untapped energy resource can be exploited more rapidly.

Sluggish Energy Price Reform Is An Area Of Concern

After seven years of transition, energy prices for network energies, such as electricity, gas and heat, still show substantial deficiencies. Prices are generally below economic levels. In some cases, price increases have been below inflation and consequently end-user prices decreased in real

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terms. Cross-subsidies from industrial consumers to households are common. Electricity prices for industries are about 75 percent of the levels of western Europe. Prices for household supplies are even lower and only about 50 percent of those in western Europe. Many governments still use electricity, gas and heat prices as a social policy instrument for providing support to low-income households.

In contrast, prices for oil products are generally liberalized, and pre-tax prices reflect market levels. However, as the share of excise taxes are much lower, end-user prices remain much below western European levels. Relatively low end-user prices together with real income increases in some transition economies explain the surging demand for transport fuels.

The consequence of governments' reluctance to liberalize energy prices is substantial. Energy utilities are unlikely to have sufficient income to modernize their infrastructure or to invest in new capacity. In many cases these industries rely on direct state support or bilateral aid, such as grants for environmental protection and nuclear safety investment, or sovereign guarantees. Clearly, such a policy is not sustainable in the medium and longer term.

The negative impact of (cross) subsidies and uneconomically low energy prices goes beyond the relatively narrow issue of insufficient demand-side investment. Low energy prices not only reduce the incentive for energy efficiency, they also stimulate demand. Consequently, energy companies are forced to invest in capacity that could otherwise be avoided. This has resulted in some countries in a "supply-side shift" of investment. The price-induced shift is amplified by the fact that governments are generally more willing to provide budgetary support for capacity extensions than implementing measures to enhance efficiency. The apparent preference of government and industries alike for large-scale investments for which financing can generally be obtained more easily, for example, from multinational financial institutions, and for which project management is less difficult, is also explaining the supply-side shift. A lack of project management capacity for small-scale energy efficiency projects, which increases the project risk of demand-side investment, is an additional reason. Expertise continues to be concentrated in utilities and government offices which in the past have focused on large-scale, supply-side projects.

Some Progress In Legal and Regulatory Reform

A stable and transparent legal framework for energy sector operations is an essential feature of modern energy systems and reduces uncertainty and investment risk. However, energy sector reform has not been a top priority and lags behind macro-economic reform efforts. Even countries that have succeeded in stabilizing their economies and have opened the country to foreign investment, remain reluctant to reform the energy sector. Consequently, most of the CEE countries still need to accelerate the establishment of a modern legal and regulatory framework. With few exceptions, such as Hungary and Poland, essential legislation is still missing. In other countries, the Czech Republic, Slovakia, Slovania and Romania, energy legislation is under preparation or undergoing inter-ministerial review procedures.

A more open energy economy and an energy industry which is exposed to competition could best be served by separating ownership, regulation and government. Hungary is most advanced and has created an Energy Office as an independent regulator for the gas and electricity industries. The recently approved Polish Energy Law foresees a similar institution that should be established soon. Other countries would benefit from such efforts.

Foreign direct investment (FDI) is essential to provide capital investment, to reduce the burden on budgetary expenditures, and to accelerate capital stock turnover. FDI provides the countries with new technologies and modern management practice, thereby improving the performance of the energy sector and enhancing efficiency. Sound economic policies, an open economy, low inflation and stable exchange rates are necessary conditions for attracting foreign investment. Not surprisingly, the countries that have attracted most of FDI are also those which are at the forefront in macro-economic reform and economic recovery. For the more advanced CEE countries, per capita FDI inflow is similar to the European Union, whereas in Romania and Bulgaria FDI is less than one tenth that of the EU.[5]

Ownership and Privatization

Private capital is an essential feature for modern energy economies. Private ownership generally enhances efficiency, accountability and productivity. The involvement of foreign companies also provides access to modern and efficient technologies, such as combined-cycle gas turbines for power production. Private investment reduces the financial burden on the state, which is important for transition economies where financial resources are even more scarce than in the west. But private ownership of energy industries, and in particular in the electricity and gas sectors, is still the exception. Since 1995 only Hungary has partially privatized its gas distribution and electricity industries. In Poland and the Czech Republic, some local electricity gas utilities have been somewhat successful in attracting private and foreign capital, but no large-scale privatization of core gas or electricity industries have yet been undertaken. The new Romanian government has declared its willingness to undertake macro-economic reform but still needs to decide on the structure of the energy industry and the level of private sector involvement and foreign investment that it wants to achieve.

Slow progress in privatization can partly be explained by governments' reluctance to relinquish state ownership and control over energy industries, which are sometimes considered as strategic enterprises. A close and often opaque relationship between governments and the management of energy industries, which can be frequently found as one of the legacies of the former central-planning system, also works against privatization.

Central and Eastern Europe Is Key To Western Europe's Energy Supplies

Energy markets and trade help forge the links between east and west. The region's importance for east-west energy trade almost certainly will substantially increase in the coming years. The integration of CEE into European and world energy markets, the increased role for transit of gas from the FSU and the closer links in electricity will shape the development of energy economies in eastern Europe. Transition economies need to be prepared for the challenges that lie ahead. The Energy Charter Treaty which will come into force in 1998 will be a milestone and should assist in

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removing barriers to energy trade and investment.

The location between the resource-rich east and western European markets provides a unique opportunity and challenge for CEE countries to become important partners in pan-European energy trade. Russia, together with Turkmenistan, supply more than 25 percent of total western European gas needs. As Russia seeks to expand its export capacities, for example by constructing a second major pipeline to western Europe, Poland could become a key player for transit of essential supplies to western Europe. Transit countries, like Ukraine, Slovakia and Poland (once the Yamal pipeline is completed), are and will remain essential to security of supply for many western European countries. There are also signs that the role of Romania and Bulgaria in European gas trade will increase as these countries will transit gas to Greece and the successor states of the former Yugoslavia.

In the electricity sector, technological improvements have allowed Hungary, Poland and the Czech and Slovak Republics to operate their electricity networks jointly with the western European Network (UCPTE) since autumn 1995. The connection of these networks not only provides for enhanced system stability and customer service, it is also essential for increasing electricity trade and energy security. It is likely that the UCPTE network will soon embrace south-eastern European countries, whose technical conditions at present do not allow network integration. With support from the EU Phare program, utilities and equipment manufacturers are studying the requirements for and consequences of including these countries in the UCPTE network, which would eventually stretch from Portugal to Bulgaria.

Enhancing Energy Security Remains A Key Priority

The CEE region's dependence on energy imports is significant, with some countries, such as Bulgaria, Latvia, Lithuania and Slovakia, importing more than 60 percent of their energy needs. Oil and gas resources are extremely limited in the region and most of the supplies are imported from Russia. The dependence on one supplier for oil, gas and, to some extent, nuclear fuel supply, raises additional energy security concerns. As the only significant domestic energy source is coal, which is gradually losing market share and whose production in the region is often not economic, it is likely that the region's import dependence, which was close to 30 percent in 1995, will increase.

Import diversification is an essential part of energy policy objectives to enhance supply security. The construction of alternative supply routes would allow CEE countries to diversify their imports, but these are only gradually emerging. The re-opening of the Adria pipeline after disruption caused by turbulence in some successor states of the former Yugoslavia, and the completion of the Ingolstadt - Kralupy - Litvinov pipeline allows Hungary, the Czech Republic and Slovakia to diversify oil imports. Continuing cost-advantages of Russian imports, for instance in the case of Slovakia, has minimized the use of these alternative supply routes. The recently established gas link between Hungary and Austria has reduced Hungary's dependence on Russian gas. An agreement for gas supplies between the Czech Republic and Norway that was concluded in 1997 will also improve diversification.

With the exception of Hungary, which became the 24th member of the International Energy Agency in 1997, CEE countries are generally ill prepared to cope with energy supply disruptions. Oil stock levels are much below the Agency's stock holding requirements of 90 days of net imports. Given their high import dependence, there is no room for complacency, and CEE economies and import-dependent countries of the CIS need encouragement to establish emergency legislation and to implement a fair and equitable financing mechanism for stock holding.

For Bulgaria, Croatia, the Czech Republic, Lithuania, Romania, Slovakia and Slovenia nuclear energy is seen as a pivotal component of energy and environmental policies. Those countries which operate certain types of Soviet-type nuclear which are considered of higher risk, such as Bulgaria, Lithuania and Slovakia will need to continuously enhance plant safety to operate these plants in accordance with international safety practices. Although investment in safety upgrading has been significant, capital requirements will remain substantial for plant decommissioning and the back-end of the fuel cycle.

These investments together with those for traditional environmental protection measures, such as flue gas cleaning, are likely to be undertaken only if private capital takes the lion's share. However, this will require a business climate which is open, stable and transparent.

Footnotes

[1] Central and Eastern Europe includes Albania, Bulgaria, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, the successor states of Yugoslavia and the Baltic States.

[2] Transition report 1997, EBRD 1997.

[3] *Energy Statistics and Balances of Non-OECD Countries, 1994-1995*, IEA/OECD, Paris, 1997.

[4] *CO_2 Emissions from Fuel Combustion, 1972-1995*, IEA/OECD, Paris, 1997.

[5] *World Investment Report, 1997*, UNCTAD, Geneva, 1997.

Election Results Announced

The polls for the 1998 Association elections closed on November 1 with Hoesung Lee being elected President-elect, Hossein Razavi elected Vice President of Publications, Arild Nystad, Vice President and Secretary and Michelle Michot Foss elected Vice President for Conferences.

Hoesung Lee is an Advisor to the Korea Energy Economics Institute having previously served as its President. He holds a BA in Economics from Seoul National University and Ph.D. in Economics from Rutgers University. Previously he was President of the Korea Resource Economics Association and Advisor to the Energy Minister and the Minister of Energy and Resources. He was IAEE Vice President for International Affairs in 1994-95, and has served as an appointed Council member, Chairman of the Korea affiliate and on the President's Advisory Board. He is a board member of Hyundai Corporation and Co-Chair of IPCC Working Group III.

Michelle Foss is Director of the Energy Institute of the University of Houston's College of Business Administration and an Assistant Research Professor in the Department of

Decision and Information Sciences. She holds a BS from the University of Southwestern Louisiana, an MS from the Colorado School of Mines and a Ph.D. from the University of Houston. Dr. Foss has done extensive consulting on energy and other natural resources, environmental permitting and industrial siting in the United States, Mexico and Indonesia. She has broad IAEE involvement including being a past president of the USAEE Houston Chapter, serving on the Board of Editors of *The Energy Journal* and as chair or cochair of various conferences.

Arild Nystad is Managing Director of RC Consultant in Norway. He holds an M.Sc. and Ph.D. from the Norwegian Institute of Technology and a postgraduate degree in Petroleum Engineering and Petroleum Economics from Ecole Nationale Superieure du Petrole et des Moteurs at IFP. He was formerly Director, Petroleum Resource Management Division of the Norwegian Petroleum Directorate; Chief Scientist at the Centre for Petroleum Economics at Chr. Michelsens Institute and Scientist at the Continental Shelf Institute, both in Norway. He was IAEE Vice President for Conferences from 1994 through 1997 and was instrumental in the establishment of the Norwegian Affiliate.

Hossein Razavi is Director of the Energy Sector, Europe & Central Asia of the World Bank. He holds a BS and MS in Engineering and a Ph.D. in Economics from the University of Maryland. He was formerly Chief of the Oil & Gas Division of the World Bank. His IAEE involvement includes serving as an appointed Council member in 1994 and as member of the Board of Editors of *The Energy Journal* since 1995.

Pindyck and Johnson Honored by IAEE

Robert Pindyck and Anne-Marie Johnson have won the 1997 IAEE Outstanding Contributions to the Profession Award and the Journalism Award, respectively.

Pindyck is Mitsubishi Bank Professor of Applied Economics at the Sloan School of Management, Massachusetts Institute of Technology. He received his SB, SM and Ph.D. degrees from MIT, joining the faculty after receiving his doctorate. He is also a Research Associate with the National Bureau of Economic Research and has been a Visiting Professor of Economics and Fellow at the Institute of Advanced Studies, Tel-Aviv University.

He has consulted widely including with the Department of State, Department of Energy, Federal Energy Administration, Federal Reserve Board of Governors, The World Bank, a number of foreign governments and many private businesses.

Additionally, he serves or has served on the editorial boards of the *Journal of Economic Dynamics and Control, Energy Economics, The Journal of Energy and Development, Energy Systems and Policy* and the *Journal of Industrial Economics*.

The Outstanding Contributions to the Profession Award has been given annually since 1981 to an individual deemed to have made an outstanding contribution to the field of energy economics and its literature. Michael Hoel of the University of Oslo won the award in 1996.

Anne-Marie Johnson is an Associate Editor of the *Middle East Economic Survey*. Before joining MEES in 1993, she was with *Petroleum Intelligence Weekly* and prior to that with Chevron and Mobil where at one time or another she served in planning, operations, shipping and transportation.

She received her BA from the University of California, Berkeley and an MA from the Fletcher School of Law and Diplomacy at Tufts University.

She has been covering the oil and gas industry for more than ten years.

The IAEE Journalism Award is given annually for excellence in written journalism on topics relating to international energy economics. The 1996 Award winner was Isabel Gorst with *Petroleum Intelligence Weekly*.

The IAEE Awards Committee this year included Robert Mabro, Walter Mead, Mohan Munasinghe, and Peter Odell with Tony Finizza, Chairman for the Outstanding Contributions Award and Isabel Gorst, Amy Jaffe, Al Troner and Finizza for the Journalism Award.

Award Recommendations Solicited

The IAEE Awards Committee, chaired by Immediate Past President Dennis O'Brien, seeks recommendations from the membership for the Association's 1998 Awards.

Annually, the Association makes two awards: The *Outstanding Contributions to the Profession* Award and the *Journalism* Award. Occasionally, it also makes an award for *Outstanding Contributions to the Association*.

The *Outstanding Contributions to the Profession* award is made to an individual judged to have made singular contributions to the field of energy economics and its literature. The award was won in 1996 by Michael Hoel and in 1997 by Robert Pindyck.

The *Journalism Award* is made for excellence in written journalism on topics relating to international energy economics. It was won in 1996 by Isabel Gorst and in 1997 by Anne-Marie Johnson.

The *Outstanding Contributions to the Association* award is made to an individual judged to have made a distinguished and significant contribution to the IAEE and its well-being. It was given in 1993 to Toyoaki Ikuta and in 1994 to Melvin Conant

Recommendations should include a letter citing reasons why the committee should consider the individual being nominated along with samples of the individual's work that would be relevant to consideration.

Recommendations should be sent to:

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