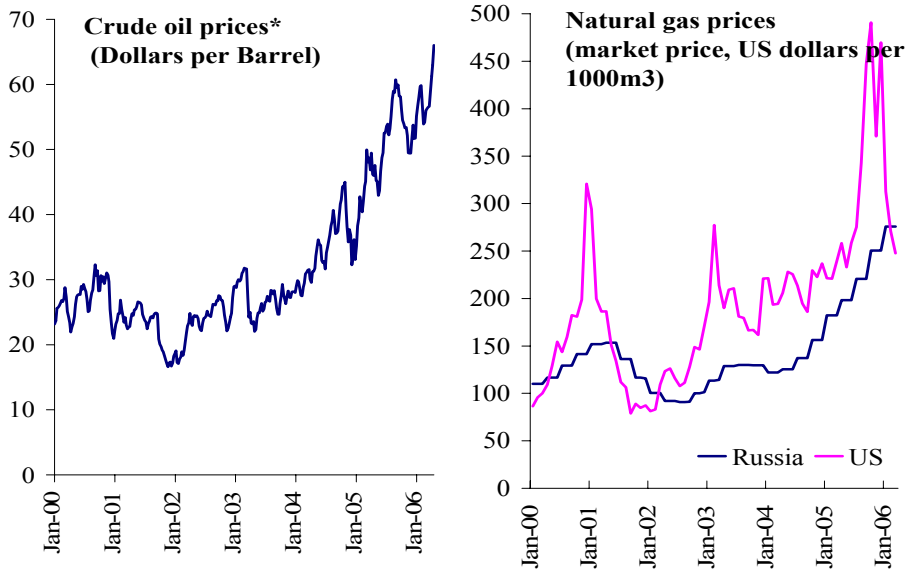
ENERGY SUPPLY IN CENTRAL EUROPE AND THE BALTICS[1]

The recent tightening of world energy markets has led to a debate about the sustainability of energy supplies to the EU8. This note provides some background on the present and prospective energy needs of these countries and how they are being met. We conclude that the region's dependence on gas deliveries from Russia—the prime source of energy--is likely to increase in the short and medium term, driven by rapid growth and relatively high energy dependency. Substantial price increase appear inevitable in the Baltics, putting into questions their near-term aspirations to adopt the Euro. Recent initiatives to develop a common European energy policy are still in their infancy.

Global Background

The tight situation on the world energy markets is likely continue in the foreseeable future. Energy prices have been rising for almost three consecutive years, driven by both a strengthening of global demand and rising uncertainties about supply (Chart 1). The April 2006 World Economic Outlook suggests that due to limited excess capacity of oil exporters, the medium-term supply-demand balance is expected to remain very tight, and oil prices will persist near current levels. It is likely that gas prices will follow the same path due to historical evidence of their high and positive correlation with oil prices.

Chart 1. Energy prices development



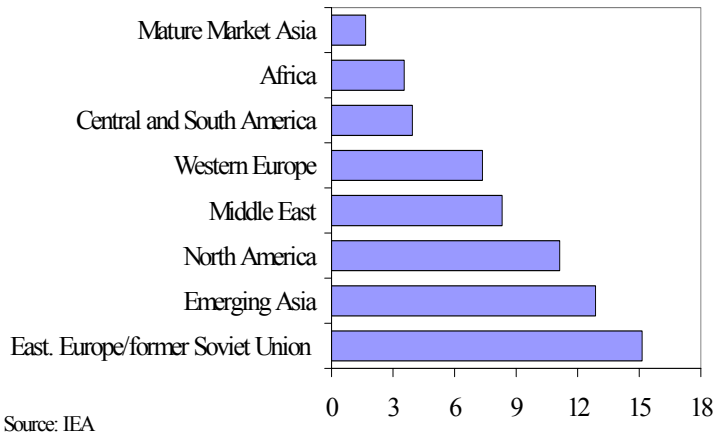
Source: EIA, IMF IFS.
* All Countries Spot Price FOB Weighted by Estimated Export Volume

[1] Written by Marcel Tirpak, Economist in IMF Regional Office, July 2006.

Long-term forecasts by the International Energy Agency (IEA) suggest that natural gas will be the fastest growing component of world primary energy consumption (Chart 2). The IEA expects natural gas consumption to grow by an average annual rate of 2.3 percent for the period 2002-2025, i.e., faster than oil (1.9 percent) and coal (2.0 percent) consumption. Almost one-half of the total incremental growth in worldwide natural gas demand will be generated by electric power sector. This trend is partly driven by the Kyoto Protocol which obligates signatory countries to shift power generation towards less polluting primary energy sources such as natural gas.

Globally, the IEA projects the highest increase of natural gas consumption for Eastern Europe and former Soviet Union countries. In its International Energy Outlook from June 2005 the IEA expected consumption of natural gas in these countries to grow by 63 percent until 2025, with the electric power sector accounting for nearly 60 percent of the total increment.

Chart 2. Projected increase of natural gas consumption by region for 2002-2025 (in trillion cubic feet)

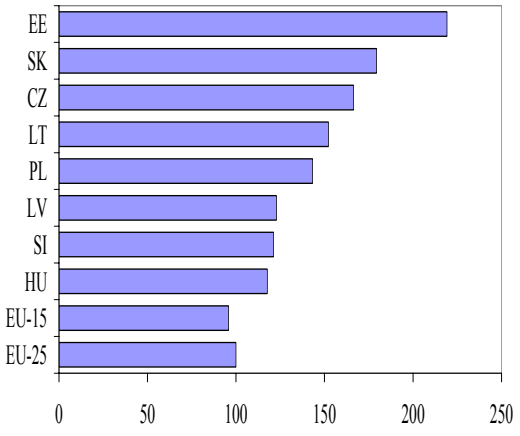


Source: IEA

Rising Energy Demand

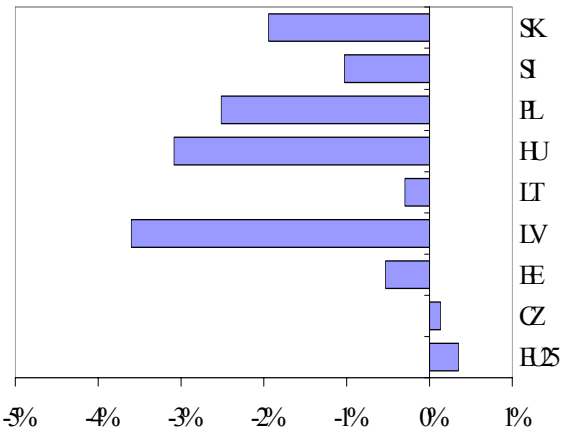
The energy intensity of new member states is still relatively high. Only three countries (Hungary, Slovenia and Latvia) are relatively close to the average level of energy intensity in EU25 (Chart 3), with energy intensity in Estonia particularly high. Most countries have made progress towards better energy efficiency, reflecting technological upgrading and the general shift towards the service sector. But the change in energy intensity in recent years has differed widely between EU8 countries (Chart 4).

Chart 3. Total energy intensity in 2003
(TOE per million GDP in PPS relative to EU-25, in %)



Source: EEA

Chart 4. Change of energy intensity* 2000-2003
(unit: kilogram of oil equivalent per 1000 Euro)

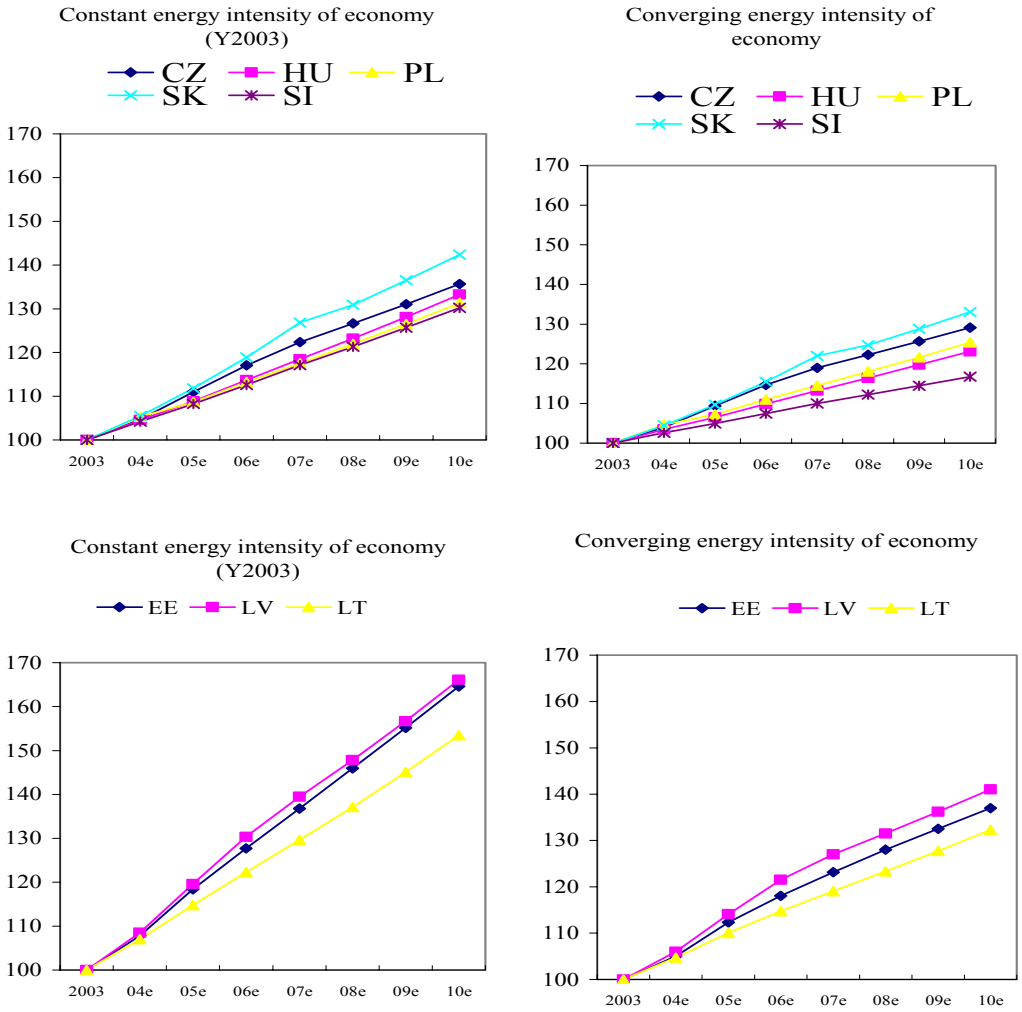


*Gross inland consumption of energy divided by GDP (at constant prices, 1995=100)
Source: Eurostat

Energy consumption is projected to increase substantially, especially in the Baltics
The evolution of overall energy needs will depend on individual countries' growth prospects and further progress in reducing energy intensity. Simple scenarios (Chart 5) suggest that energy consumption in the Baltics may increase in the range of 30-70 percent over the next five years, as opposed to 20-40 percent in the Central European countries.[2]

[2] For a detailed description of the estimation approach see Appendix II.

Chart 5. Gross inland consumption
(in percent, 2003=100 percent)



Source: Eurostat, WEO, staff calculations.

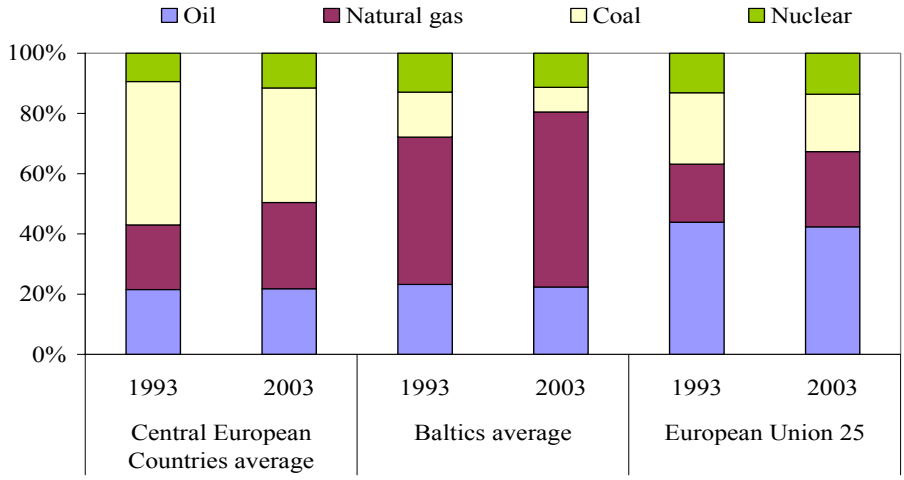
The Dependence on Gas

The structure of energy consumption in the EU8 is shifting towards natural gas. Over the period 1993-2003, the share of this "cleaner" energy source in overall consumption has increased in all countries, mainly at the expense of coal (Chart 6).The dependence on natural gas is particularly high in Slovenia, Latvia and Estonia[3] (Table 1).

[3] Lithuania is an exception within the Baltics. Its high dependency on nuclear energy is related to existing nuclear power plant (Ignalina). As part of the EU Accession Treaty, Ignalita is due to be closed in December 2009, resulting in a change of the energy consumption structure.

While the consumption structure in Central European countries is more diversified (partly due to the availability of domestic resources such as coal in the Czech Republic and Poland), they have also witnessed a shift towards higher natural gas consumption during 1993-2003. This could be due, inter alia, to improving access to natural gas as the primary source of energy for households (for heating) and some pricing advantages, as supply contract with Russia have not yet fully adjusted to West European terms.

Chart 6. Structure of energy consumption



Source: BP Statistical Review of World Energy June 2005

Table 1. Structure of energy consumption (2003, in %)

	Oil	Natural gas	Coal	Nuclear	Hydro-electricity
Czech Republic	19.9	17.8	47.8	13.5	0.9
Hungary	25.6	49.6	14.3	10.5	0.0
Poland	22.5	11.4	65.3	0.0	0.8
Slovakia	17.7	33.9	22.6	21.5	4.3
Estonia	9.0	67.2	23.9	n.a	n.a
Latvia	10.9	88.4	0.8	n.a.	n.a.
Lithuania	47.0	18.1	0.0	33.7	1.2
Slovenia	22.6	60.9	16.5	n.a.	n.a.
EU8 avg.	21.9	43.4	23.9	9.9	0.9
European Union 25	40.5	23.9	18.3	13.0	4.2

Source: BP Statistical Review of World Energy, June 2005

Import Dependence from Russia

Russia is the dominant supplier of energy in the region. In 2004, Russia serviced more than a two thirds of gas needs in the EU8, except Slovenia (Table 2a). Dependence on Russian oil is even higher (Table 2b), with half of the region (incl. Poland and Hungary) entirely relying on oil supplies from Russia. The orientation towards Russia reflects the existing Soviet-era pipeline infrastructure (Picture 1), long-term supply contracts, and still favorable pricing (only partly due to lower transport cost on account of the geographical proximity). Russia is reportedly planning to increase its role as provider of energy in the

region: Gazprom recently announced plans to raise its share of the gas market in Europe from 26 per cent to 33 per cent by 2010[4]. The IEA, OECD and other prominent experts have voiced concerns, however, that Gazprom, the only Russian company which is allowed to export gas, will not be able to meet rising demand from Europe due to a lack of investment. By the same token, occasional threats by Gazprom officials to divert supplies to Asian customers do not seem very credible.

Table 2a. Import of natural gas from Russia (2004)

Country	Imports from Russia (in bil. cubic meters)	Percentage of total imports
Estonia	0.9	100.0
Latvia	1.5	93.8
Lithuania	2.9	93.5
Hungary	9.3	84.9
Slovakia	5.8	79.5
Czech Republic	6.8	69.4
Poland	6.3	69.2
Slovenia	0.2	18.2

Table 2b. Import of oil from Russia (2003)

Country	Imports from Russia (in thousand tons)	Percentage of total imports
Lithuania	8661.0	100.0
Latvia	1866.0	100.0
Hungary	5273.0	100.0
Poland	17181.0	99.4
Slovakia	5551.0	99.2
Czech Republic	4452.0	69.4
Estonia	21.0	n/a
Slovenia	n/a	n/a

Source: Krashakov, Alexey (2005): "Rossiya perekraivaet ekonomicheskuyu kartu mira", Nezavisimaya gazeta, available via internet http://www.ng.ru/economics/2005-12-16/1_partners.html (in russian language only)

Picture 1. Gas pipeline infrastructure

[4] Source: Wagstyl, Stefan:"Gazprom attacks EU gas market plans, in: Financial Times, April 26, 2006, p. 2.

Source: BBC

Norway and Algeria are still important suppliers of natural gas to the European Union as a whole, but play a lesser role in the EU8. However, supply from these sources is increasingly impeded by constraints on pipeline capacity and the relatively high investment cost for building gas-liquefying stations (LNG). The European Commission expects that if current trends persist, Russian gas would increase to 80% of EU-wide imports over the next 25 years. Dependence on Russia is already much higher in the EU8, except for Slovenia which partly relies on gas supplies from Algeria.

Pricing Implications

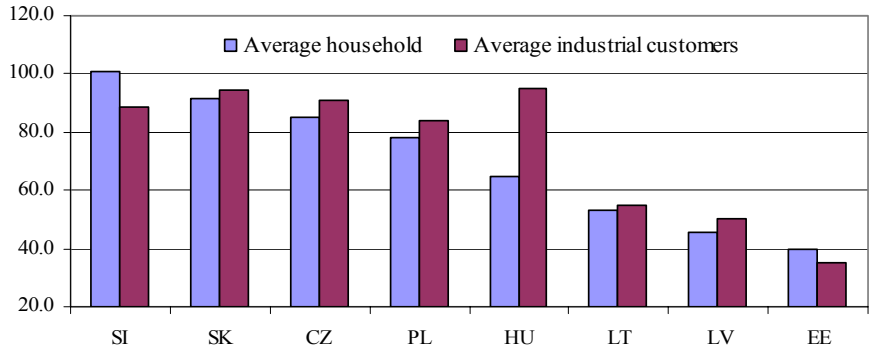
The Baltics still enjoy considerably lower prices on gas imports from Russia than the Central European countries. Information is difficult to come by as it is treated confidentially, both by Gazprom and its clients. It appears, however, that Gazprom still grants a price discount to Estonia, Latvia and Lithuania compared to Western Europe, even after correcting for the lower transport cost implied by their proximity to Russia—a remnant from the time before these countries left the Russian interest sphere Informal contacts from the industry report that the import price is presently at around €105 per 1000 m3, while the world price equivalent for the Baltics (adjusted by transport costs) is considered to be around €140.

Gazprom intends to adjust its prices to world market levels within the next 2-3 years, implying an increase of at least 30 percent in the Baltics. This assumes that crude oil prices, to which gas prices are linked by contract, remain constant at May 2006 levels[5]. Indeed, prices are already adjusted frequently and unilaterally (by fax from Moscow), both in response to general energy price movements and the catch-up targeted by Gazprom. In Estonia, the price was increased three times in 2005 alone.

[5] While long-term supply contracts specify quantities and technical details, they usually link the supply price to crude oil by a pre-determined formula.

The Baltic countries' import price advantage is clearly reflected in final consumer prices, which are much lower than in other EU8 countries. Chart 7 shows that the both household[6] and industrial consumers in the Baltics pay no more than half of the price of average EU25 household —substantially less than in other EU countries.

Chart 7. Prices in EU8 as of January 1st 2006
(as % of EU25 average price, all taxes excluded)



Source: Eurostat

Moreover, gas suppliers in the Baltics have not yet fully passed on rising import prices to final consumers. Spot price for Brent crude oil and Russian gas increased by 100 and 150 percent, respectively, between January 2004 and January 2006. In principle, this should be reflected in final consumer prices with a lag of about six months, reflecting regulatory inertia and the need for advance publication. Table 3 shows, however, that the pass-through has been much smaller in the Baltics than in the Central European EU8 countries.[7] Since there is no evidence of fiscal subsidization, energy suppliers must have experienced a substantial compression of operating margins which they are unlikely to be able to sustain.

[6] We follow Eurostat definition of the average household, which is defined as household with annual natural gas consumption of 83.70 GJ. Average industrial customer annually consumes up to 41 860 GJ of natural gas. The EU25 price is average price weighted by national consumption of natural gas in respective country.

[7] Complete time series of gas prices for final consumers in EU8 countries are available since January 2004. Until than countries were not obliged to publish data about gas prices. Industry insiders put the price increases in the Baltic countries slightly higher than what is shown in Eurostat data, e.g., an increase of 7 percent for the average consumer in Estonia. Note that nominal exchange rate appreciation helped keep prices of gas supplies down over examined period, particularly in Poland, and to lesser extent in the Czech Republic and Slovakia.

Table 3. Gas price adjustments for final customers as of Jan. 2006 (in %, Jan. 2004 = 100)

	Households		Industrial customers	
Country	in €	in national curr.	in €	in national curr.
EE	0%	0%	-2%	-2%
LT	15%	14%	16%	16%
LV	27%	32%	17%	21%
HU	28%	22%	42%	34%
SI	39%	40%	79%	81%
PL	49%	21%	59%	29%
SK	49%	37%	44%	32%
CZ	57%	37%	75%	53%
Brent crude	104%			

Source: Eurostat

Informal industry contacts confirm that substantial increases for end-consumers of gas are in the pipeline. Confidential information from E.ON, a minority stake holder in all three Baltic gas suppliers, suggests that substantial price increases can be expected in the near future (Table 4). This reflects both the delayed catch-up from past import price hikes and the elimination of the 30 percent discount.

Table 4. Projected annual gas price increases for final customers

Country (in %, base year 2004)	2006	2007
Estonia	36.8	49.9
Latvia	34.2	47.1
Lithuania	55.9	41.5

Source: E.ON (confidential, based on present state of negotiations with Gazprom)

These gas price adjustment may have a substantial impact on inflation developments in the Baltics, further bleakening their prospects for Euro adoption. While the direct effect is still small—the weight of gas in the HICP basket ranges from 0.3 percent in Estonia to 1.3 percent in Latvia[8]—the high energy intensity and dependence on gas from Russia suggests ripple-effects throughout the economy. Second-round effects on inflation expectations are further fuelled by the general overheating of these economies, as evidenced by strong wage and credit growth, widening current account deficits and signs of asset bubbles. All thing being equal, the likely energy price hikes described above will make it even more difficult to achieve the Maastricht inflation criterion over the next 2-3 years. It may also undermine competitiveness, especially of those industries that are energy-intensive (e.g. base metals, which constitute 15 percent of Latvia's exports).

EU-wide Policy Response

[8] Due to low price of gas, its weight the HICP consumer basket is still very small for Baltic economies. The same applies for overall energy component. This will obviously change as prices increase.

Against the background of rising energy prices, the EU Commission in March 2006 issued a "Green Paper" that attempts to frame an EU-wide energy strategy. The paper stipulates that making energy supplies sustainable , competitive and secure is a common EU challenge. Beyond generalities and stating the obvious (e.g., the importance of conservation, the usefulness of a common monitoring system), it contains little in the way of a clear objective, let alone a concrete action plan (see Appendix I). Meanwhile, the International Energy Agency has weighed into the discussion by recommending greater reliance on nuclear power. This idea was generally supported at the G8 summit in July 2006.

Energy security has become a hot button issue. The EU8 countries, in particular, are increasingly uncomfortable with their dependence on energy supplies from Russia. They see the December 2005 supply disruptions to Ukraine (which also affected EU countries) as evidence that Russia is using its dominant position for political purposes. This view was famously echoed by US Vice President Cheney in a speech in Vilnius in May 2006. Russia has made no secret that it intends to increase prices for all of its EU customers to world market levels. There are also concerns about Russian energy suppliers' interest in buying downstream facilities in the EU, while Russia has so far resisted liberalizing access to its gas export pipelines, to allow independent Russian producers to access the EU market. These principles are to be anchored in an common energy charter, but chances of ratification by Russia have slimmed after the recent adoption of a law formalizing Gazprom's monopoly on gas exports..

How to face the increasing dependence on Russia as an energy supplier is proving a particularly contentious issue within the EU. Partly in response to the Green Paper, the Polish government proposed to create an Energy Security Treaty, modeled after NATO and also including the US and Canada. It is based on the "musketeer principle" of "all for one , one for all"—essentially a commitment by signatories to come to each others' support in the event of shortfalls of energy supplies from Russia. The implicit aim would be to increase the collective bargaining power vis-à-vis Russia. The idea initially created some interest, especially among fellow EU8 countries, resulting in a number of regional meetings. But Russia has recently been successful in playing potential signatories against each other, by offering bilateral long-term supply contracts. Germany, in particular, has continued to pursue a bilateral energy partnership with Russia, as evidenced by the plan to develop a gas pipeline directly linking the two countries. On the EU level, ideas to include the US into a multilateral agreement are viewed with suspicion. It is therefore uncertain if the Polish initiative has much future.

APPENDICES

Appendix 1: The Green Paper "An European Strategy for Sustainable, Competitive and Secure Energy"

The Green Paper *"An European Strategy for Sustainable, Competitive and Secure Energy"*- a coherent European Energy Policy - published on 8 March 2006 by the European Commission. The Green Paper puts forward suggestions and options that could form the basis for a new comprehensive European energy policy. It identifies three main objectives of a common European energy policy: sustainability, competitiveness and security of supply. Those objectives include the following targets that the EU wants to achieve in the long-term:

1. ***Sustainability***
   i. Developing competitive renewable sources of energy and other low carbon energy sources and carriers, particularly alternative transport fuels,
   ii. Curbing energy demand within Europe,
   iii. Leading global efforts to halt climate change and improve local air quality.
2. ***Competitiveness***
   i. Ensuring that energy market opening brings benefits to customers and to the economy as a whole, while stimulating investment in clean energy production and energy efficiency,
   ii. Mitigating the impact of higher international energy prices on the economy and its citizens,
   iii. Keeping Europe at the cutting edge of energy technologies.
3. ***Security of supply***

Tackling the EU's rising dependence on imported energy through:

i. An integrated approach – reducing demand, diversifying the EU's energy mix with greater use of competitive indigenous and renewable energy, and diversifying sources and routes of supply of imported energy,
ii. Creating the framework which will stimulate adequate investments to meet growing energy demand,
iii. Better equipping the EU to cope with emergencies,
iv. Improving the conditions for European companies seeking access to global resources,
v. Making sure that all citizens and business have access to energy,
vi. Establishing common EU external policy.

The Green Paper identifies wide rage of possible threats to the security of energy from natural catastrophes, terrorists attacks to energy supply interruptions due to political risk. It proposes creating a monitoring system responsible for informing about any alarming signals. This would be:

- ***European Energy Supply Observatory*** monitoring the demand and supply patterns on EU energy markets, identifying likely shortfalls in infrastructure and supply at an early stage and complementing on EU level the work of the International Energy Agency;

- ***European Centre for Energy Network*s** responsible for improving network security though increased collaboration and exchange of information between transmission system operators in defining and agreeing common European security and reliability standards.

Apart from monitoring activities The Green Paper stresses the need for steps to ensure that EU can deal with potential energy supply disruptions. There are plans to change the existing Directive on gas and electricity security supply and to add new regulations concerning oil and gas stocks to ensure that EU can react to shorter term emergency gas supply disruptions in a manner that ensures solidarity between Member States, whilst taking account of different potential for storage in different parts of the EU. Necessary infrastructure changes are a prerequisite for putting into practice the idea of EU energy solidarity.

The Green Paper attaches also a great importance to the proper choice of energy mix. Each Member State and energy company can choose its own energy mix, but this choice should take into consideration common EU energy strategy. The Strategic EU Energy Review that is going to be conducted in the nearest future is aimed at supporting EU countries in their choice of national energy policies that would comply EU strategic energy objectives. However, an overall strategic objective has not been set so far. The most probable objective of EU energy strategy now under discussion could be aiming for a minimum of the overall EU energy mix originating from secure and low-carbon energy sources.

Third important element EU energy supply security policy is a creation of common external energy policy. This will help the EU to react to challenges of high and volatile energy prices, increasing import dependency, strongly growing global energy demand and global warning. In this area EU Commission proposes: identifying European priorities for the construction of new infrastructure necessary for the security of energy supplies; developing a pan-European Energy Community Treaty; a new energy partnership with Russia; a new Community mechanism to enable rapid and coordinated reaction to emergency external energy supply situations impacting EU supplies; deepening energy relations with major producers and customers; an international agreement on energy efficiency.

Appendix II. Estimation of energy consumption

Data on gross inland energy consumption are available on the Eurostat web page until 2003. For period 2004-2010 we estimate energy consumption for EU8 countries using two scenarios.

The first scenario is based on constant level of energy intensity of 2003 for respective country. We use final data on real GDP growth until 2005. For year 2006 and 2007 we use projections of real GDP growth from World Economic Outlook (April 2006). Medium-term forecasts of real GDP growth for period 2008-2010 are taken from the IMF Staff Reports for respective countries.

The second scenario assumes a converging level of energy intensity in EU8 countries. Our projection of energy intensity development is based on Markandya et al. (2004)[9]. They investigate the relationship between income convergence and energy intensity convergence for 12 countries of Central and Eastern Europe (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, Slovenia, and Turkey). They conclude, that on average a 1 percent decrease in the per capita income gap between developed economies (old EU member states) and Central and Eastern Europe economies leads to decrease of the energy intensity gap by 0.7%. Following this result we estimate the average annual rate of income convergence by using data from Schadler et al. (2005)[10], i.e. years to EU income convergence, and income ratios to EU average of respective country. The average rate of convergence is calculated by using the interest rate of discount[11]. For simplification we assume linear path of income convergence. Assuming a constant level of energy intensity for old EU member states we calculate level of energy intensity for respective EU8 country. Applying data on real GDP growth (same as for the first scenario) we finally estimate gross inland energy consumption for respective country.

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[9] Markandya Anil, Suzette Pedroso, and Dalia Streimikiene (2004): *Energy Efficiency in Transition Economies: Is There Convergence Towards the EU Average?* FEEM Working Paper No. 89.04

[10] Schadler Susan, Ashoka Mody, Abdul Abiad, and Daniel Leigh (2005): *Fund Surveillance and Growth in the New Member States of the European Union: A Regional Review*, mimeo, Table 3, pp. 6

[11] $i = \sqrt[n]{\left(\frac{FV}{PV}\right)} - 1$, where *FV* is future value (targeted income ratio to EU average), *PV* is present value (recent income ratio to EU average), and *n* is number of years to reach a targeted income ratio to EU average.