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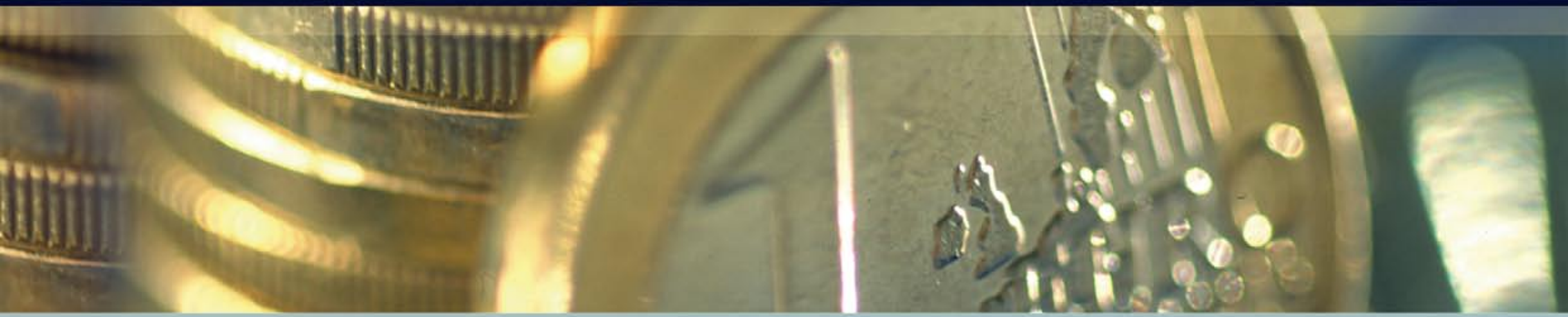

The economic aspects of the energy sector in CIS countries

CASE (Centre for Social and Economic Research)

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The Economic Aspects of the Energy Sector in CIS Countries

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List of acronyms

ACG – Azer-Chiraq-Gunashli (oil deposit)

ADB – Asian Development Bank

AMD – Armenian dram

ANPP – Armenian Nuclear Power Plant

ANRA – Armenian Nuclear Regulatory Authority

APC – average cost of production

bcm – billion cubic meters

BTC – Baku-Tbilisi-Ceyhan (pipeline)

BTE – Baku-Tbilisi-Erzurum (pipeline)

CAC – Central Asia - Center (pipeline system)

CEE – Central and Eastern Europe

CEO – chief executive officer

CIS – Commonwealth of Independent States

CO2 – carbon dioxide

CPI – consumer price index

CPC – Caspian Pipeline Consortium (pipeline)

DG ECFIN – Directorate-General for Economic and Financial Affairs

DG RELEX – Directorate-General for Exteral Relations

DG TRADE – Directorate-General for Trade

DG TREN – Directorate-General for Energy and Transport

DIT – direct inflation targetting

EBRD – European Bank for Reconstruction and Development

EC – European Commission

ECB – European Central Bank

ECT – Energy Charter Treaty

EEP – external energy policy

EIB – European Investment Bank

EITI – Energy Investment Transparency Initiative

ESCO – Energy Service Company

EU – European Union

EUR – euro

FDI – foreign direct investment

FOREM – federal wholesale electricity market (in Russia)

GATT – General Agreement on Tariffs and Trade

GDP – gross domestic product

HBS – household budget survey

HPP – hydropower plant

IEA – International Energy Agency

IMF – International Monetary Fund

INOGATE – Interstate Oil and Gas Transport to Europe

IPS - Im-Pesaran-Shin (test)

kg – kilogram

kWh – kilowatt hour

LLC - Levin-Lin-Chu (test)

LNG – liquefied natural gas

LPG - Liquefied petroleum gas (mostl propane)

LRMC – long-run marginal cost

LSMS – Living Standards Management Study

MENA – Middle East and North Africa

Mt – million tonnes

MTEF – medium term expenditure framework

Mtoe – million tonnes of oil equivalent

MW – megawatt

MWh – megawatt hour

M2 – broad money

NESCO – Network of Energy Security Correspondents

NFRK – National Fund of the Republic of Kazakhstan

NWF – National Welfare Fund (in Russia)

OECD – Organisation for Economic Co-operation and Development

OHR – Office of the High Representative (in Bosnia and Herzegovina)

OLS – ordinary least squares

OPEC – Organisation of Petroleum Exporting Countries

OSF – Oil Stabilization Fund (in Russia)

PCA – Partnership and Co-operation Agreement

PIP – public investment program

PPI – producer price index

PPP – purchasing power parity

PSA – production sharing agreement

PSRC – Public Services Regulatory Commission (in Armenia)

PWT – Penn World Tables

QFA – quasi fiscal activity

QFD – quasi fiscal deficit

RER – real exchange rate

RUR – Russian rouble

SFO – Serious Fraud Office (in the UK))

SOFAZ – State Oil Fund (in Azerbaijan)

SWOT – Strengths, Weaknesses, Opportunities, and Threats

t – tonne

TAP – Turkmenistan-Afghanistan-Pakistan (pipeline)

tcm – thousand cubic meters

TPES – total primary energy supply

TPP – thermal power plant

UAE – United Arab Emirates

UCTE – Union for Coordination of Transmission of Electricity

UK – United Kingdom

UNCTAD – United Nations Conference on Trade and Development

UNDP – United Nations Development Program

UNEP – United Nations Environment Programme

US – United States of America

USD – US dollar

VAT – value added tax

WB – World Bank

WEF – World Economic Forum

WEO – World Economic Outlook

WTO – World Trade Organisation

Foreword

CASE – Center for Social and Economic Research - was awarded the contract to conduct a study on the "Economic Aspects of the Energy Sector in CIS Countries". The European Commission (DG ECFIN) asked CASE to "analyse the macroeconomic aspects of the energy sector in CIS countries, whose economies rely heavily on this sector, and assess the challenges to fiscal, monetary and exchange rate policies associated with a high share of energy in the economy".

The terms of reference ("specifications" following the publication of the contract notice in OJEU 2007/S 87-105973 dated 05.05.2007) further asked for a report that would:

- assess the macroeconomic importance of the energy sector for each country in question, in terms of – but not restricted to – GDP, employment, budgetary revenues contribution, balance of payments;
- present an economic analysis of the specific features of the energy industry, namely, its reserves, exporting capabilities, prices and destinations, investment level, ownership and market structure of the energy sector;
- discuss related macro issues, such as – but not only – sustainable fiscal frameworks and rules (including non-oil fiscal deficits), the resource curse, Dutch Disease, quasi-fiscal activities (QFAs) and the various approaches used to address them;
- address other issues that are relevant for trade and investment flows with the EU – including the role of the transport infrastructure and the prospects for their potential development – that are relevant for an EU economic strategy towards these countries.

The structure of the report closely follows the requirements set out in the "specifications".

The following authors have contributed to this report: the Executive summary was prepared by Wojciech Paczyński and Marek Dąbrowski. Wojciech Paczyński provided the introductory chapter and literature review in Chapter 2. Elena Rakova and Gleb Shimanivich worked on Chapter 3 on the role of energy sector in CIS economies. Balázs Égert contributed a section on Dutch Disease in Chapter 4. Also for this chapter, Marek Dąbrowski contributed a section on monetary policy challenges, Artur Radziwiłł on fiscal policy challenges, Irina Tochitskaya and Elena Rakova on the quasi-fiscal roles of the energy sector, Boris Najman on the channels of redistribution of oil revenues and Wojciech Paczyński on the resource curse debate. Chapters 5 and 6, on the importance of the CIS for the EU's energy supply and on energy policies in CIS countries, were prepared by Emmanuel Bergasse, Agata Łoskot and Elena Rakova. Wojciech Mańkowski created the maps included in Chapter 5.

The country background materials for the Appendix were prepared by the following authors: Micheil Tokmazishvili (Armenia and Georgia), Sabit Bagirov (Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan), Elena Rakova (Belarus), Aziz Atamanov (Kyrgyzstan), Agata Łoskot (Moldova), Julia Popova (Russia), Ivan Poltavets (Ukraine). The note on Tajikistan used materials prepared by Muhammadi Babaev.

The final report benefited from comments and suggestions on the interim and draft final versions that we received from Richard Pomfret, Leonid Grigoriev and the European Commission team led by Lúcio Vinhas de Souza, who was the ECFIN coordinator of this study. We also received comments from participants of the State University – Higher School of Economics conference in

Moscow in April 2008, and from participants of a special "EU-Russia Energy Dialogue" workshop held in Moscow in May 2008, and from participants of a ECFIN workshop held in Brussels in June 2008. Joe Harper and Max Nuijens helped in language editing of the text. The layout of this document is based on the template provided by Clive Huggan.

The report was edited by Wojciech Paczyński, who co-ordinated the research team. Marek Dąbrowski helped in editing chapters 1-4. Lúcio Vinhas de Souza edited the ECFIN “Economic Paper” version of this study.

Executive summary

This report analyses the macroeconomic aspects of energy sector development in the Commonwealth of Independent States (CIS) countries. It also briefly covers selected aspects of EU-CIS energy relations, looking at the potential of the CIS region as a source of energy supplies for the EU and at energy policy options in the CIS.

Energy is a key sector with important implications for growth and macroeconomic stability in several CIS countries. Over the last few years several processes have been shaping the internal dynamics of energy sector development in the CIS, macroeconomic outcomes in these countries and prospects for co-operation in the energy sphere between the EU and CIS. This report is devoted to analysis of these issues.

Probably the most important factor is the rapid rise of international oil prices. After reaching record lows in 1998 (USD 10-15 per barrel), prices increased to around USD 30 per barrel during 2001-2003, before starting a rapid surge, surpassing USD 100 in early 2008. Given the natural gas pricing mechanism that is applied for EU imports from Russia, this has resulted in a similar surge in prices for natural gas, with the price of Russian gas at the German border almost tripling between 2002 and 2007 to over USD 300 per thousand cubic meters at end-2007, and above USD 350 in early 2008. This has in turn stimulated a significant increase of gas prices in intra-CIS trade, which had until 2005 stayed at an artificially low level. Ensuing tensions between CIS gas importers trying to prevent or limit the pace of price adjustment and gas exporters, mainly Russia (and in fact between different interest groups trying to maximise their rents), has increased the perceived uncertainty of gas supplies also for the EU.

The energy sector and its macroeconomic importance in the CIS

Chapter 3 focuses on qualitative and quantitative analyses of the macroeconomic importance of the energy sector in CIS countries. The CIS region is one of the largest global energy producers, contributing around 15% of world oil exports and over 25% of gas exports. In 2006, it accounted for 10% of global proved oil reserves and 32% of gas reserves. Russia accounts for a large majority of this, but in the future Kazakhstan also has a chance of entering the group of the largest global oil producers.

The role of the energy sector in CIS economies differs greatly from one country to another. Our rough estimates suggest that in 2005 the Azerbaijani energy sector had the largest share in GDP , accounting for over 35%. In Kazakhstan and Turkmenistan these shares exceeded 15%, while in Russia it was just below 15%. Belarus, Ukraine and Uzbekistan were characterised by shares of between 5% and 15%, while for other CIS countries energy sector contributions were below 5%.

Energy commodities account for majority of exports in several CIS countries. In Azerbaijan the share is over 80%, around 70% in Kazakhstan and around 60% in Russia. Older data on Turkmenistan also suggest shares in the range 60-80%. In Belarus, with its strong refining industry working on Russian crude, oil products accounted for below 40% of total exports. For other countries the magnitudes are smaller – around 20% in Armenia (electricity), and below 10% elsewhere in the CIS. Oil and gas were the main drivers of total export growth in the key producing countries (Russian, Kazakhstan and Azerbaijan), at least until 2005, since when their role has decreased somewhat.

Energy commodities are also a major element in import bills for a number of CIS economies. In 2005, energy products accounted for around 30% of imports in Belarus, Ukraine and Kyrgyzstan, and over 15% in Moldova, Georgia, Tajikistan and Armenia. This suggests a vulnerability of these countries to energy price shocks.

Energy extraction, export, transport and processing generate substantial fiscal revenues. In 2006, they accounted for over half of central government budget revenues in Azerbaijan, while in Russia they were just below half of the federal budget (11% of GDP; the share in general government revenues was close to one third). In Kazakhstan, oil proceeds (10% of GDP) were just above one third of general government revenues in 2005-2006. In Belarus, buoyant oil refining sector and other energy sector related activities (oil and gas transit, etc.) is believed to have contributed close to 20% of central government proceeds in 2006.

The CIS energy sector has attracted substantial FDI inflows, in many countries being the primary target of foreign investors. In the first half of 2007, several large acquisitions in the Russian electricity and gas industries brought investments into energy sector to a level of over USD 28 billion, around 60% of the total FDI inflow during this period. In previous years, the share of the energy sector in total FDI inflows varied between 10% and 25%. In Azerbaijan and Kazakhstan, oil and gas-related investments dominate in the cumulative stock of FDI. In some other CIS countries energy sector projects also attracted substantial inflows (such as Russian investments in Belarus related to the construction of the Yamal-Europe gas pipeline), but their overall role was less pronounced.

Most CIS countries are very inefficient energy consumers compared to OECD economies, if nominal GDP is used for comparison. In 2005, Ukraine used 10 times more energy per USD 1 of its GDP than the average for OECD countries (and almost four times more than in China). The comparison looks better when PPP exchange rates are used in calculating GDP levels. On this measure Ukraine needs almost three times more energy per unit of GDP than the OECD region (and 2.3 times more than China), while Armenia and Georgia are at the OECD average. CIS energy consumption per capita is significantly below OECD average for all CIS countries, except from Russia. CO_2 emissions vary substantially between CIS countries, with very high levels in Kazakhstan, Russia and Turkmenistan contrasting with relatively low emissions in Armenia, Georgia, Kyrgyzstan and Tajikistan.

Since 2005, prices of Russian and then also Caspian gas exported to CIS countries have started to increase from a very low level following a major increase in the EU market. This has had substantial consequences in many respects. First, in the past, below-market prices were a key factor underpinning the sub-optimal industrial structure in the importing countries and as such any increases in gas prices should help to correct this, creating incentives to energy-saving reforms and be welfare-improving. Second, the subsidisation of CIS consumers implied significant financial losses for Gazprom, which grew substantially with the increase in EU energy prices, so there is a purely economic rationale for the change in the Gazprom’s policy. On the other hand, Gazprom’s new pricing policy (and the way it has been implemented) has given some justification to accusations suggesting that gas pricing has also become a tool for rewarding and punishing CIS countries depending on their policy towards Russia in general and Gazprom in particular. By early 2008 prices still varied quite substantially between CIS importing countries (with tariffs for Georgia and Moldova being almost twice as high as for Armenia and Belarus).

The energy boom in large CIS energy producers (mainly in Russia) has had an impact on improved growth prospects in other CIS countries but the magnitude of this spillover effect is difficult to estimate. Some evidence suggests that trade and investment channels do not play a very strong role. In contrast, growing demand for mainly unskilled labour in Russia possibly plays a larger role and remittances from Russia are important for economic development in Armenia, Georgia, Moldova and Central Asian countries.

Key macroeconomic issues related to energy sector functioning

Chapter 4 looks at certain macroeconomic issues related to the specific mode of functioning of the energy sectors in CIS countries.

The first question is whether energy resource wealth can be considered a positive or negative factor in assessing the long-term development prospects of CIS net energy exporters. Historically, several economies abundant in natural resources and oil and gas in particular have experienced periods of weak economic growth and their overall level of development appears lower than one could expect given the value of their energy resource wealth or actual values of export revenues generated during the last decades. This empirical observation led to the coining of the term "resource curse" to describe how countries with large natural resource deposits may tend not to be successful in using that wealth in the best possible way.

While most of the empirical evidence indeed suggests a rather negative impact of resource dependence or resource abundance on long-term growth and income per capita levels, the results are not always particularly robust and depend on the period being analysed. Furthermore, there are signs implying that the recent decade may in fact have been much better for oil- and gas-rich economies than earlier periods. Part of this better performance may be related to improved management of oil windfalls, following often traumatic experiences in the 1970s and 1980s.

From a policy perspective, a key question concerns the mechanisms through which natural resources may affect economic development and what policies and / or other factors may help countries to avoid a resource curse or turn it into a blessing.

The key mechanisms suggested in the literature that can lead to a negative impact of oil and gas booms on long-term development prospects include volatility of oil prices, Dutch disease, deterioration of political systems, deterioration of state institutions, negative political economy effects and under-investment in human capital.

Several policies have been identified that may limit the potential negative consequences of resource wealth and maximise potential gains. These include appropriate fiscal policies (see below), careful support for non-energy sectors of the economy, investment in human and physical capital, avoiding excessive income inequalities, strengthening the links between government and society, promotion of broad-based participation in decision making, increasing transparency and accountability and other steps to strengthen democratic mechanisms and a system of checks and balances. All the above recommendations require long-term and systematic reform efforts.

From the CIS perspective we conclude that to date no serious negative spillovers from the energy resource wealth can be identified. Indeed, oil exports in the CIS region appear to be positively linked to growth, in particular in recent years. The key question is related to its effects on long-term prospects, especially via political channels and governance mechanisms. Several potentially worrying signs are visible, but there are also more encouraging signals. Broadly speaking, the development of democracy and civil society in energy-rich countries appears to be facing substantial problems, possibly even relative to other CIS states, where the situation (and trends) are far from satisfactory. On the other hand, the quality of economic governance, effectiveness of macroeconomic policies and progress in some areas of economic reforms may appear stronger, at least in Russia and Kazakhstan, than elsewhere in the CIS. It is too early to formulate a decisive diagnosis as to whether oil and gas will be a blessing or a curse for the CIS countries and there is still plenty of room for manoeuvre in terms of respective countries' choice of which development and governance models to follow.

On the purely economic front, the result of the empirical analysis presented in Section 4.3 may indicate some, although not particularly strong, symptoms of the Dutch disease, such the link between oil prices and nominal and real appreciation of CIS currencies and a declining share of manufacturing industry in GDP. On the other hand, there does not seem to be any correlation between oil prices and the relative price of non-tradable goods, thus casting doubt on the functioning of the resource movement and spending effects.

The short statistical data series available and the influence of other, sometimes very fundamental, factors suggest the need for a very careful interpretation of the results. Among these other factors one can mention the ongoing restructuring process taking place in all the CIS economies, which inherited huge structural distortions, especially over-industrialization. It is therefore very difficult to distinguish between the decline in the share of manufacturing industries caused by oil- and gas-related Dutch disease from the more fundamental trend of closing down or downsizing many post-Soviet manufacturing enterprises that failed to survive in a more competitive environment.

As for real exchange rate appreciation, it is very difficult to isolate a pure Dutch disease effect from the correction of initial currency under-valuation (especially after the 1998-1999 series of financial crises) and other factors that contributed to the appreciation trend (e.g. the Balassa-Samuelson effect).

The absence of the "resource curse" and rather weak evidence of Dutch disease can be partly explained by prudent and responsible fiscal policies, which generated high fiscal surpluses, particularly in Kazakhstan and Russia (far less so in Azerbaijan). Lack of data on oil- and gas-related fiscal revenues does not allow one to undertake such an analysis for Turkmenistan and Uzbekistan, although some other observations, in particular on the size of quasi-fiscal activities (see below) indicate that these two countries continue to conduct populist policies.

Prudent fiscal policies in Kazakhstan and Russia have been supported by progressive institutional mechanisms such as special oil stabilization funds and fiscal rules aimed at setting aside and saving for a "rainy day" revenue windfall from high oil and gas prices and expanding energy production.

Unfortunately, Azerbaijan while being the first CIS country to create a State Oil Fund (SOFAZ) as early as in December 1999, cannot be described as conducting prudent and responsible fiscal policy. On the contrary in fact, the extraordinary pace of fiscal expansion in recent years and evident symptoms of macroeconomic overheating will likely create serious challenges in the near future. Furthermore, oil production in this country will reach its peak in the next few years, after which a gradual output decline is forecast.

Most recently, the hitherto prudent picture of Russia's fiscal policy has also become somewhat blurred due to the politically motivated (pre-election) fiscal expansion at the end of 2007. It remains to be seen whether this loosening can be easily reversed in the near future, as it has been spearheaded by senior Russian policymakers.

One can expect that sustained high energy prices (the most likely global scenario now) will increase the political temptation in all the analysed countries to spend a higher share of the oil and gas windfall for domestic needs instead of saving it abroad. Policymakers will face increasing difficulties sustaining the argument that the "normal" long-term oil price will remain at a level of USD20-30 per barrel, the threshold value assumed in most of the stabilization fund regulations. If such a scenario materializes, the danger of Dutch disease and other symptoms of "resource curse" may become imminent.

Monetary policy, the second element of macroeconomic policy, can claim less success than fiscal policy. Although the CIS region recorded disinflation in the first half of the 2000s, progress in this sphere was not particularly impressive (with several countries unable to bring inflation down to single-digit territory). More recently, the situation in this sphere has deteriorated, being further complicated by mounting global inflationary pressure. While in the 1990s, fiscal imbalances and domestic credit expansion were the main sources of inflationary threats, in the current decade the biggest challenge comes from a balance of payments surplus and rapidly accumulated international reserves. This phenomenon is largely due to the energy and commodity booms that have benefited several CIS economies.

Most CIS central banks have been unable to address these new challenges in an appropriate way, focusing too much on resisting real and nominal exchange rate appreciation and too little on disinflation. In addition, the USD anchor used by some of them for pegging national currencies has proved pro-inflationary, especially in the most recent period. As global inflationary pressures are unlikely to cease in the near future, CIS central banks must rethink their monetary policy strategies. They should either modify their exchange rate anchor and allow one-off corrective revaluation or introduce direct inflation targeting strategies allowing their currencies to float freely.

Abundance of energy resources may also provoke their ineffective domestic use, including hidden subsidization and cross-subsidization of energy consumers or certain categories of them, mainly households. The Soviet legacy in this sphere has been particularly negative, with deep energy under-pricing and cross-subsidization resulting in huge energy tariff distortions. Very high inflation or even hyperinflation episodes at the beginning of the 1990s made this situation even more difficult.

The empirical evidence analysed in Section 4.5 confirms that most CIS countries continued to undertake large-scale quasi-fiscal activities (QFAs) through the energy sector for quite a long time. These involved energy under-pricing, cross-subsidization (usually in favour of households), tolerance for payment arrears and huge losses in the energy transmission and distribution systems. Such policies caused a deep technical degradation of the existing electricity and heating generation capacities, as well as in electricity and gas transportation and distribution networks and stopped new investments in these sectors.

Energy-poor countries heavily dependent on imports of energy resources such as Armenia, Georgia and Moldova were the first to reform, partly privatize and restructure their energy sectors and practically eliminate such quasi-fiscal activities. Other countries, including energy-rich Kazakhstan and Russia, have also entered this path more recently. The biggest scale of QFAs remains in Tajikistan, Uzbekistan, Azerbaijan and Kyrgyzstan (probably also in Turkmenistan but lack of data complicates the assessment).

Looking at the social dimension of energy booms there is no evidence that they have helped diminish income and wealth inequalities, although one cannot claim the opposite, i.e. that income and wealth inequalities increased due to them. Further, deeper and comprehensive, analyses are needed to have a clearer picture of how oil and gas revenues are distributed among various groups of population and regions. Apart from fiscal redistribution and company redistribution channels, a significant role is also played by the informal sector, deeply rooted in the economic practice of CIS economies.

CIS role for the EU energy supply

Chapter 5 analyses the current and potential future importance of the CIS region for the EU's energy supply. In doing so it takes into account significant differences between member states in import dependency for oil and gas, in diversification of directions of energy imports and in reliance on Russia and other CIS countries for supplies of energy commodities.

The key question is to what extent oil and gas production and exports from the CIS might be increasing and how much of these energy resources (natural gas in particular) will be directed to EU countries. In the case of oil, given the global nature of the market, the total export potential of the CIS matters in determining global oil prices, but export directions are less of an issue. The situation is different for natural gas, where pipelines largely determine how much can be sent, and where.

EU oil demand is increasing only slowly, but declining domestic production implies that import dependency (already high, with more than 80% of consumed oil being imported) is gradually increasing and is set to go to effectively 100% in the 2030s. EU gas demand has seen solid growth for the last several years and is forecast to increase further in the next two decades or so. Given the bleak prospects for domestic production, gas import dependency is set to rise from a current modest level of just below 60% to above 80% in the 2020s. Importantly, these aggregated figures mask major difference among EU member states. There are only a few significant oil and gas producing countries (mainly the Netherlands, the UK and Denmark) and already most economies see their oil and gas import dependency levels close to 100%.

Moreover, the degree of diversification of oil and gas imports and in particular the reliance on Russian or CIS supplies varies greatly among EU member states. Several countries (especially the Baltic States, Finland, Slovakia and Bulgaria) rely on Russian gas for almost all domestic consumption. These and several other East European countries have limited options for diversifying their gas supplies should such a need arise. This contrasts with the situation in the European oil market, where despite the dominance of Russian imports in several countries, existing transport infrastructure and a developed spot market allow for a rapid switching to alternative supply sources.

Between 2000 and 2006 EU gas imports from Russia increased minimally and the share of Russia in total EU27 gas import volume has declined from 49% to around 39%. In contrast, EU oil imports from Russia surged between 2000 and 2006, with its share in the volume of total EU27 imports increasing from 19% to around 32%. In 2006, Caspian oil producers accounted for a modest 5% of total EU oil imports, while their gas supplies were marginal.

For Russia, which accounts for 80% of total CIS oil and gas production and exports, EU markets represent its main outlet for crude oil exports (50% of the total), oil products (33%) and gas (70%) and are the main sources of export revenues.

Future oil and gas output, domestic consumption and export trends in Russia and other CIS energy producing countries remain subject to a very wide margin of uncertainty. For Russia, 2020 projections range from 150 to 310 Mt for oil exports and between 185 and 310 bcm for gas exports. The main determinants of future trends include economic factors (investment in upstream and transport capacities, domestic market development), regulatory issues (upstream access and pipelines for independent producers, domestic gas pricing), as well as progress in energy efficiency policy and technical issues (rate of recovery).

In the Caspian region area, the oil export potential of Kazakhstan and Azerbaijan may be in the range of 125-175 Mt by around 2020. Potential Caspian and especially Turkmenistan gas exports are extremely difficult to predict with any degree of precision. All determinants of export trends mentioned in the case of Russia are also valid for the Caspian region and transport infrastructure may prove to be among the key factors, due to the landlocked location of the main producers and limited capacity of existing pipelines to potential markets other than Russia.

How much of future CIS oil and gas exports will reach EU markets is another question. In the case of Russia, we believe that the EU will remain the main gas export market and in particular it is unlikely that any re-orientation of sales originally scheduled to the EU is possible. The gradual expansion into Asian markets will be based on development of new fields that are in any case too distant from Europe to make deliveries there economically viable. Over the next two decades, Russian gas exports to the EU are likely to stay in a range of 150-200 bcm.

Future directions of Caspian Sea area gas exports are somewhat less certain. At present only Turkmenistan exports larger volumes of gas and they are mostly delivered to Ukraine (under a contract between Turkmenistan and Gazprom). Azeri gas (from the Shah Deniz field) started reaching Turkey in mid-2007 and during the next years the volumes are likely to increase, although they will still stay negligible from the EU perspective. More significant volumes of Caspian gas could reach EU markets through Russia. The chances of securing deliveries of substantial volumes of Caspian gas to the EU markets via pipelines independent from Russia appear slim at this stage. One already ambitious project in this respect – the Nabucco pipeline that would link Erzurum in Turkey with the Austrian gas hub Baumgarten – could deliver there up to 30 bcm by 2020. Assuming that Caspian Sea gas should constitute the bulk of this volume, a Trans-Caspian pipeline should be built linking the gas producing areas in Turkmenistan and Kazakhstan with Baku, the starting point for the already existing Baku-Tbilisi-Erzurum pipeline. At present, the outlook for a Trans-Caspian pipeline or a connection between the Caspian Sea region and Turkey via Iran is uncertain.

Among the risks for CIS energy supply to the EU one should list a lower production or higher internal consumption scenario in Russia and elsewhere in the CIS, supply disruptions resulting from the poor physical condition of pipelines, or from regional or domestic political or economic crises and the potential monopolistic behaviour of Gazprom given its growing grip on various elements of the gas chain, including the EU transmission and distribution segments. The EU goal of adopting a common energy policy, whose external dimension would include a strong component focused on relations with the CIS, could increase security of energy supplies from this region. Making such a policy work will not be an easy task and apart from political determination would require an adequate institutional and regulatory framework.

Long-term gas contracts concluded in 2006 foresee deliveries of above 100 bcm of Russian gas to various EU clients until around 2030. This implies that long-term contracts will remain the major contractual solution for EU gas import from Russia at last within this time horizon.

The purchase and transit of natural gas between EU importers and non-EU suppliers rely on bilateral contracts while there is no overall regulation applicable except the Energy Charter Treaty framework. In the case of EU-Russia relations its current relevance is limited since Russia has not ratified the ECT and is unlikely to do so unless the wider compromise is reached, including some form of the Transit Protocol that would operationalize the ECT provisions for transit of energy commodities.

Strategies and policy options for energy sector development in the CIS region

Chapter 6 presents the current regulatory and institutional framework of the energy sector and identifies the key challenges and problems currently limiting its development or that are likely to become a barrier to growth in the future, with further economic and social consequences. It then discusses potential solutions to these problems, tries to assess current domestic policies and, where relevant, also the potential role of external actors, notably the EU.

The current status of the energy sector in the CIS is partly determined by pre-existing conditions, i.e. the specific features of the infrastructure and central planning inherited from the Soviet period and partly by reform policies that have been carried out – with a mixed record – since the mid-1990s.

One can mention several factors that have determined the transformation of the energy sector and its dynamics. First, the Soviet legacy of relatively well developed energy infrastructure (although largely outdated) and a significant decline in energy demand due to the economic contraction in the 1990s meant a delay in more ambitious and necessary reforms and tended to rely on quick and temporary solutions. Second, the still prevailing public perceptions of provision of electricity, gas and other utilities as an entitlement rather than as a service that needs to be bought at a price reflecting the costs of production have been making tariff increases very difficult politically. Third, the presence of vertically integrated monopolies that retain power and influence beyond the energy sector makes network utility reforms tough to implement even in the highly developed countries (as evident from EU problems in this sphere), making the task facing less developed CIS economies very difficult indeed. Fourth, political conflicts between some CIS countries, the absence of a culture of effective international co-operation and in some cases also the lack of transportation infrastructure decrease potential gains from energy trade and – more broadly – energy co-operation in this region. The inability to find efficient and sustainable solutions in regional water-gas-electricity interdependence among Central Asian countries can serve as a good example. Fifth, governments tend still to cumulate the functions of policy-making, regulation enforcement (with weak regulatory institutions) and ownership control of state-owned companies. This concentration of power leads to conflicts of interest and political interference and makes reforms more difficult. In addition, in many CIS countries there are close personal connection between political leadership and energy sector management.

Finally, from today's perspective, a long period of severe under-investment in energy infrastructure combined with a strong economic rebound in the region since 2000 (and a resulting increase in energy demand) have created a situation where energy supply disturbances may be in the offing, endangering the reliability and quality of services in the medium term. State-owned vertically integrated gas and electricity monopolies or oligopolies tend to dominate the markets and control the infrastructure, largely preventing the emergence of effective competition. Energy efficiency remains low, while poor corporate governance and a lack of transparency further deteriorate the investment climate. This has coincided with a major increase in global commodity prices.

Among the three major energy sub-sectors analysed in this report, the reforms of the oil downstream industry are probably the most advanced, reflecting the global character of the oil market, a less complicated regulatory framework, greater flexibility in oil transport infrastructure, and private sector participation. A clear trend of strengthening the state's grip on the sector is, however, visible in Russia and Kazakhstan and, to some extent, in Azerbaijan. The more assertive domestic policies towards foreign investors suggest that CIS governments cannot resist the temptation to change the contract rules agreed during the 1990s when oil prices where low and the political and economic position of CIS governments vis-à-vis foreign companies was much weaker than it is today. The effects of this policy change are yet to be revealed. In the case of Russia this may have a negative impact on output and potential expansion of exports.

The reform record in the electricity sector is mixed, with substantial progress and promising trends in a number of countries (Russia, Armenia and most other European CIS countries), contrasting with less success or even a complete lack of any reforms in Central Asia and Belarus. Building efficient regulatory bodies, setting up functioning electricity markets and tariff reforms have proved to be the most difficult components of the reform packages.

The gas industry is the least reformed. This can be related to the special position of Gazprom in Russia, a heavy reliance on gas for electricity generation in a number of CIS economies, the difficult interplay between political and energy relations among CIS countries and the concentration of gas resources (apart from Russia) in remote, land-locked CIS countries with the least reformed economies (Turkmenistan and Uzbekistan). The state-owned vertically integrated gas monopolies, which combine commercial and regulatory functions, maintain tight control over the sector's infrastructure, largely preventing third party access to the pipeline network. Prices remain set by governments below full cost-recovery levels and cross subsidization is common despite successive price increases, including in Russia.

Domestic reforms in energy sectors are also linked – and often closely so – to the production and export strategies of major producing countries and the largest companies, such as Gazprom, as well as strategies of current and prospective transit countries.

All these actors attempt to maximise short-term gains from existing and future production, export and transportation opportunities. These objectives are very often in conflict with the interest of EU importing countries. Major producers seek to enhance their market opportunities, expand their market arbitrage power and exploit opportunities arising from monopoly control of existing transport infrastructure. Additionally, domestic price reforms will clearly affect export incentives, relative to expansion in domestic markets. Transit countries are keen to maximise flows of resources through their territories. These strategies may, in some instances, be detrimental to the long-term development of domestic energy sectors because they limit competition, distort investment decisions and discourage more efficient energy use. The above factors are unlikely to disappear any time soon and thus need to be taken into account in the choice of reform options for the sector.

For example, the Russian authorities aim to regain control over energy production and exports in the CIS region through long-term purchase agreements (with Central Asia), direct investments (mostly mid-stream and downstream) and in some cases using energy pressure. Gazprom, the main vehicle of Russia's external energy strategy, has significantly extended its direct control along the gas supply chain (exploration, transportation / transit, refining, trading, distribution) in the CIS but also in the EU. The new large and very expensive gas export pipeline projects (Nord Stream, South Stream) aim to directly connect Russia with major European gas markets and bypass current transit routes, which involve some kind of 'transit risk' for Gazprom. These projects could limit the economic rationale for alternative pipeline projects, in particular Nabucco, which would provide independent access to the EU market for gas from the Caspian Sea region and/or Middle East. Gazprom also continues to set bilateral agreements with importing and transit countries both inside and outside the EU. Such a strategy appears to be rational from the company's perspective. From the EU's perspective, however, the question remains to what extent will this be an additional obstacle to its (yet to emerge) common energy policy.

Apart from an increasingly evident risk of insufficient energy supply, transit and distribution capacities, the second factor that may drive the reform process in the CIS is related to price developments. Following global oil prices, the prices of natural gas in Europe have roughly tripled since 2002. This has prompted price adjustment in the intra-CIS gas trade, a process that is still unfinished and that can eventually bring gas and electricity prices to economically justifiable levels in CIS economies.

The first step in preventing or mitigating future energy shortages should address the issue of the CIS economies' large energy inefficiency, given that energy-conservation policy has not been given appropriate levels of recognition to date. Also, increased intra-CIS energy trade has a large potential to improve security and efficiency. However, also in this case there appears to be little serious policy effort to seize such opportunities, possibly because of political problems between some CIS states and perceived trade-offs in terms of supply reliability.

We see the domestic energy price adjustment driven by rising oil and gas prices as an opportunity to enforce more substantial energy sector reforms, in particular improving energy efficiency on both the supply and demand side. However, the complexity of such reforms implies that external pressure of this kind, while potentially helpful, might not be sufficient to ensure optimal policy choices.

Here we see room for carefully designed support from the international community and the EU in particular. Technical assistance to CIS governments to help them develop their own coherent, market-based and sustainable energy and environmental strategies and tools would assist the reform process. A key institutional reform is to finalize the separation of governmental energy policy-making functions from regulatory enforcement and ownership of companies.

Energy issues should continue to be an important component of the European Neighbourhood Policy (ENP) and European Neighbourhood and Partnership Instrument (ENPI) financial resources should allow quite ambitious undertakings. There should be scope for further promotion of domestic reform policies in the context of the EU-Russia Energy Dialogue and in the framework of the Baku Initiative, which involves Central Asian countries. The Energy Charter Treaty (ECT) could also be used more actively as a framework for energy sector development and for resolving transit issues. In the case of smoother progress in effective policy implementation and regulatory reforms, combined with a strong commitment to further reforms, some European CIS countries may find the Energy Community an attractive solution. All this can be also seen as an opportunity for the emerging EU external energy policy.

In EU-supported and EU-financed activities it is important to distinguish clearly between supporting solutions that are optimal for CIS countries and the energy interests of EU member states. It is also important to distinguish between healthy competition for projects and actions that may be politically-driven and may hamper development prospects in certain CIS countries. The EU should take into account and accommodate some fundamental differences of interests between oil, gas, electricity producing / exporting / transit CIS countries and its objectives of ensuring reliable and low-cost supplies. The EU should avoid taking one or the other of two extreme approaches towards Russia: one along the lines "we do not like you, we do not trust you", and the opposite one "we accept your requests and close our eyes", as none of these is likely to produce positive outcomes.

We expect the EU to be able to benefit from more efficient and transparent energy sector operations in the CIS countries with adequate investment in supply and transit.

Country background notes

The report is complemented with background notes presenting the key characteristics of energy sectors in all CIS economies. Below we provide summaries of these notes.

Armenia

GDP (current USD billion)	8.0	Average annual GDP growth 2000-2007, %	12.6
Population, million	3.5	GDP per capita (USD at PPP)	4942
Total Primary Energy Supply (TPES), Mtoe	2.6	TPES/GDP, Mtoe / 000 USD, base year 2000	0.75
Crude oil production (Mtoe)	0.0	Oil & oil products TPES (Mtoe)	0.4
Gas production (Mtoe)	0.0	Gas TPES (Mtoe)	1.3

Notes: All data in this table and tables for subsequent countries refer to 2005 apart from population, GDP, and GDP per capita, which are for 2007.

Sources: IMF, WEO database (first two rows), IEA, Key World Energy Statistics 2007 (third row); IEA, Energy statistics by country (last two rows). Mtoe stands for million tonnes of oil equivalent.

Armenia has no mineral energy resources but has substantial hydropower potential. It is almost fully dependent on imported energy products – gas from Russia through Georgia and smaller volumes from Iran (also controlled by Gazprom), oil and oil products from Georgia, Iran and Russia and nuclear fuel from Russia. Over 70% of electricity demand in Armenia is satisfied through nuclear and thermal (gas) generation, which relies entirely on inputs imported from Russia. The future of nuclear power is somewhat uncertain, as the old-type nuclear power plant is located in a seismic zone and is already close to the limits of its originally designed life span.

Russian investors (especially Interenergo, a subsidiary of RAO UES, and Gazprom) play a key role in the Armenian energy sector. Progress in electricity sector reforms looks favourable compared to other CIS countries, but the reform agenda is not completed yet.

Substantial current and potential electricity generation and the close vicinity of energy-rich Iran are the key strengths of the domestic energy sector. Conflict with Azerbaijan and difficult relations with Turkey, combined with a lack of own energy resources, the relatively weak development of hydropower and the prospects of a closing down of the only nuclear power plant, all leading to very high level of dependency on Russian supplies, are a major weakness in the Armenian energy sector. Key opportunities are the development of private small and medium-scale hydropower plants, a continuation of electricity sector reform and ensuring additional gas supplies from Iran. Potential risks include interruption of energy resource supplies from Russia and Iran (for various reasons), risks related to the functioning of an old-type nuclear reactor in the seismic zone and difficulties in ensuring competition and market regulation given the dominant role of Russian companies, most of which at the same time have a monopoly on supplies.

Azerbaijan

GDP (current USD billion)	31.3	Average annual GDP growth 2000-2007, %	15.9
Population, million	8.6	GDP per capita (USD at PPP)	7656
Total Primary Energy Supply (TPES), Mtoe	13.8	TPES/GDP, Mtoe / 000 USD, base year 2000	1.40
Crude oil production (Mtoe)	22.5	Oil & oil products TPES (Mtoe)	5.3
Gas production (Mtoe)	4.6	Gas TPES (Mtoe)	8.1

Azerbaijan is undergoing a major oil boom, with output more than doubling between 2004 and 2007 and net exports more than tripling in the same period. This made Azerbaijan the largest contributor to total non-OPEC output growth during 2006-2007. The output surge is expected to continue until around 2010, and unless new reserves are discovered after 2015 oil production is expected to decline. The recent increase in oil output comes mainly from the offshore Azer-Chiraq-Gunashli (ACG) oil deposit developed by the international consortium AIOC, with a leading role played by BP. The large majority of exports are conducted via the Baku-Tbilisi-Ceyhan (BTC) pipeline, bypassing Russia and the Bosporus and Dardanelles Straits. Small quantities are also exported via the Baku-Novorossiysk and Baku-Supsa pipelines.

Gas production has been broadly flat in recent years and Azerbaijan has been a net importer of gas due to buoyant domestic consumption. The major increases in production are expected starting from 2008 from the very large off-shore Shah Deniz field operated by an international consortium led by BP. Gas from the Shah Deniz field will be mainly exported via the Baku-Tbilisi-Erzurum pipeline, running parallel to the BTC. Azerbaijani gas is currently reaching Georgia and Turkey.

Several foreign investors are present in the Azeri oil and gas market and production sharing agreements (PSA) are the major mode of operation. The state energy company SOCAR plays an important role.

The energy sector dominates the economy and played the key role in the recent economic boom (with GDP growth averaging at around 17% annually since 1999 and exceeding 30% in 2006 and 2007). Oil accounts for well over 80% of Azeri exports. The fiscal response to the boom is generally considered less than prudent, with insufficient savings.

Large hydrocarbon reserves and access to westward oil and gas pipelines independent of Russia are the key strengths of the energy sector. Weaknesses include the physical obsolescence of electricity and gas transmission networks and limited domestic reform progress. Opportunities are focused on potential new discoveries that would allow the country to avoid a decline in oil output beyond 2015 and establishing a connection allowing westward oil and / or gas exports from Central Asian countries through Azerbaijani territory. Risks include economic problems related to excessive reliance on oil and imprudent fiscal management of the current oil windfall, as well as delayed domestic energy reforms.

Belarus

GDP (current USD billion)	44.8	Average annual GDP growth 2000-2007, %	7.2
Population, million	9.6	GDP per capita (USD at PPP)	10910
Total Primary Energy Supply	26.6	TPES/GDP, Mtoe / 000 USD,	1.46

(TPES), Mtoe		base year 2000	
Crude oil production (Mtoe)	1.8	Oil & oil products TPES (Mtoe)	7.4
Gas production (Mtoe)	0.2	Gas TPES (Mtoe)	16.9

Belarus does not produce any substantial amounts of hydrocarbons and is strongly reliant on imports, primarily from Russia. At the same time it is an important transit country for Russian gas and oil sales to Europe (with around 20% and 30% shares, respectively).

Gas is the primary input for electricity production and Belarus is a very large consumer of this commodity, significantly larger than Poland, for example. Up to the end of 2006, Russian gas imports were priced at a fraction of levels paid by other European countries. The doubling of prices in 2007 and agreed further increases are expected to strongly impact on domestic electricity and heating prices, with potentially significant consequences for households and business. For several years Gazprom has been interested in taking control of the gas transportation company JSC Beltransgaz, and import price deals have been linked to the privatisation of this company. The end-2006 deal foresees a gradual transfer of a 50% stake in JSC Beltransgaz to Gazprom during 2007-2011. Gazprom has built and currently controls the Yamal gas pipeline to Poland and Germany.

The oil sector plays an important role in the Belarusian economy and the country's two large refineries (one state-owned, the other with the participation of a Russian investor) produce substantial volumes of oil products, which account for up to 40% of total exports to non-CIS countries. Oil refining was particularly profitable (and brought substantial tax revenues to the Belarus budget) until end-2006 as Belarusian companies were importing Russian crude without Russian export duties and were then able to sell oil products at European prices. The change of this scheme slightly limited profits.

The strengths of the energy sector include developed refining capacity, a strategic location on transit corridors and proximity to EU markets. Problems relate to the role of the state as an inefficient owner and regulator, making private investments difficult. Lack of reforms, combined with a very high dependence on gas and oil supplies from Russia, make the energy sector vulnerable to business (and potentially political) pressure from Russia. Improvements in the regulatory framework, energy efficiency and the increased role of other energy sources (peat and wood, possibly nuclear) could provide opportunities for the future. Risks relate to the effects of higher import gas prices, a deterioration in the physical energy infrastructure and fiscal pressures stemming from an unreformed sector.

Georgia

GDP (current USD billion)	10.3	Average annual GDP growth 2000-2007, %	8.3
Population, million	4.4	GDP per capita (USD at PPP)	4690
Total Primary Energy Supply (TPES), Mtoe	3.2	TPES/GDP, Mtoe / 000 USD, base year 2000	0.74
Crude oil production (Mtoe)	0.1	Oil & oil products TPES (Mtoe)	0.8
Gas production (Mtoe)	0.0	Gas TPES (Mtoe)	1.1

Georgia has no mineral energy resources but has substantial hydropower potential. Fuel supply largely depends on imports, mainly from Russia and Azerbaijan. Political relations with Russia deteriorated recently, complicating the energy situation in the country. With the opening of the BTC and Baku - Tbilisi - Erzurum pipelines, the country has become an increasingly important transit corridor for Caspian Sea region oil and gas. This role is set to increase in the coming years.

Georgia imports all gas and petroleum products consumed locally. Gas import prices have increased substantially since 2006 and prompted Georgia to switch from Russian to the then cheaper Azerbaijani gas. The recent signals from Azerbaijan indicate that the price of Azerbaijani gas will likely increase during 2008.

Electricity generation mostly comes from hydropower plants (over 70%). Major power stations (owned by RAO UES from Russia) have been recently repaired and upgraded. There are substantial seasonal variations in power production with summer excess electricity exported to Turkey, Azerbaijan and Armenia and imports from these countries during the winter period. The building of high voltage links with these countries would enable more sizeable electricity exports. RAO UES and Czech investors are important players in the domestic electricity sector. Progress in electricity sector reform looks favourable compared to other CIS countries, but the reform agenda is not completed yet.

Kazakhstani state-owned KazMunaiGaz is an important investor in the gas distribution sector and in two oil terminals, at Kulevi and Batumi, while the oil terminal in Supsa is operated by a subsidiary of AIOC, a BP-led international consortium operating the BTC pipeline.

The strategic location of the country on the east-west and north-east energy transit corridors is the country's main asset. Weaknesses include outdated energy infrastructure and difficult political relations with Russia. Key opportunities are related to acceleration of the domestic reform process and expansion of the oil and gas transit along the east-west axis. Risks primarily include reform delays leading to deterioration of infrastructure and decline in energy service quality.

Kazakhstan

GDP (current USD billion)	103.8	Average annual GDP growth 2000-2007, %	10.1
Population, million	15.1	GDP per capita (USD at PPP)	11086
Total Primary Energy Supply (TPES), Mtoe	52.4	TPES/GDP, Mtoe / 000 USD, base year 2000	2.01
Crude oil production (Mtoe)	61.8	Oil & oil products TPES (Mtoe)	7.6
Gas production (Mtoe)	21.1	Gas TPES (Mtoe)	17.6

Kazakhstan has the Caspian Sea region's largest recoverable crude oil reserves and is the largest oil producer in the region. It is also an important producer of gas, coal and uranium. Helped by large FDI inflows, the oil extraction sector has been experiencing a boom over the recent decade, strongly contributing to the robust growth of the whole economy. Oil and gas production is expected to more than double over the next 8-10 years, with most of the increase being exported. Coal plays a key role in electricity generation.

In view of the expected significant growth in oil and gas exports, the government is making efforts to develop and diversify export routes that still run mainly through Russia. Oil is shipped primarily through the CPC pipeline to Novorossiysk, and northwards to the Russian pipeline system, with smaller quantities also reaching China and Iran. Future, much larger, export volumes are expected to go through the expanded CPC pipeline (assuming Russian Transneft agrees to the expansion) and / or through the BTC pipeline, assuming infrastructure is built to ship Kazakh oil to the western coast of the Caspian Sea.

Current gas production levels are broadly on a par with domestic consumption. Potentially large future exports will require pipeline infrastructure to reach markets. One option involves sales to Russia (using the expanded Central Asia – Center pipeline). Other alternatives include sales to China and Europe – both of which may require or benefit from co-operation with Turkmenistan (to ensure sufficient gas volumes). As in the case of oil, Kazakhstan is trying to diversify its export options.

For the last three years Kazakhstan has been strengthening the government's control over the oil and gas sectors, limiting the role of foreign investors, forcing re-negotiations of some PSAs, notably on the massive Kashagan oil field and actively supporting the state-owned company KazMunaiGaz.

One of the key strengths of the domestic energy sector is its massive oil and gas reserves and proximity to China. Underdeveloped export pipeline infrastructure and dependence on Russia weaken the position of the country. Opportunities are related to regional energy co-operation (notably with Turkmenistan), effective diversification of export routes and domestic reforms of the energy sector, including privatization and modernization of oil refining and technical upgrades of power and gas networks. Risk factors include a failure to diversify energy export routes and problems in development of the non-oil sectors of the economy.

Kyrgyzstan

GDP (current USD billion)	3.7	Average annual GDP growth 2000-2007, %	4.3
Population, million	5.3	GDP per capita (USD at PPP)	1999
Total Primary Energy Supply (TPES), Mtoe	2.8	TPES/GDP, Mtoe / 000 USD, base year 2000	1.70
Crude oil production (Mtoe)	0.1	Oil & oil products TPES (Mtoe)	0.6
Gas production (Mtoe)	0.0	Gas TPES (Mtoe)	0.6

In view of its very low levels of domestic production Kyrgyzstan relies on imports of gas (mainly from Uzbekistan) and oil and oil products (from Russia and Kazakhstan). The country has significant hydropower generation potential, which is currently utilised only to a limited degree.

Hydropower accounts for around 90% of generated electricity and allows for exports to Kazakhstan, Uzbekistan, Russia and China. These exports have been declining in recent years, partly due to persistently very high electricity losses resulting from the dismal state of transmission lines. The electricity sector is largely unreformed, with a dominance of state-ownership units and substantial tariff distortions, while electricity provision is not very reliable (with frequent outages).

Kyrgyzstan is an important element of the water-energy inter-relations in Central Asia, where the Kyrgyz Republic (as well as Tajikistan) would prefer to release water for electricity production in winter and accumulate it in summer, while neighbouring downstream countries (Kazakhstan and Uzbekistan) need water for irrigation in spring and summer. Co-operation between all the countries involved is far from satisfactory. Kyrgyzstan is planning privatization of its transit gas company and is eager to attract investment into gas exploration (which is currently minimal). Gazprom appears likely to enter the Kyrgyz market on this occasion.

Hydropower generation potential is an important asset of the country. Weak points include lack of reforms, ageing physical infrastructure and difficult relations with regional hydrocarbon suppliers. Key opportunities relate to increasing electricity transmission potential to neighbouring countries and reforming the electricity sector, enabling investments and deepening co-operation with other Central Asian countries in the gas-electricity-water sphere. Risks include lack of a clear strategy for energy sector reform and development, further deterioration of infrastructure and possible droughts (limiting electricity generation options).

Moldova

GDP (current USD billion)	4.2	Average annual GDP growth 2000-2007, %	6.3
Population, million	3.4	GDP per capita (USD at PPP)	2901
Total Primary Energy Supply (TPES), Mtoe	3.56	TPES/GDP, Mtoe / 000 USD, base year 2000	1.97
Crude oil production (Mtoe)	0.0	Oil & oil products TPES (Mtoe)	0.7
Gas production (Mtoe)	0.0	Gas TPES (Mtoe)	2.5

Moldova is one of the smallest energy markets in Europe and of the CIS countries. It has practically no domestic hydrocarbon resources and relies heavily on imported gas, petroleum products, coal and half of the domestic electricity demand. Moldova is also a transit corridor for Russian gas exports to Turkey and the Balkans.

Gas imported from Russia plays the most important role in the energy balance. The increases of import prices for natural gas, experienced in 2006, were passed through to consumers and were one of the drivers of inflation growth.

The very difficult situation in the power sector has obliged reform of the electricity distribution system (with a Spanish investor in a strong position). There are plans to build high voltage connections with Ukraine and Romania. The most important Moldovan power plant is located in the break-away Transnistria province. Due to difficult relations with Transnistria and to the deterioration of generating capacities in the country, Moldova imports substantial amounts of electricity from Ukraine, Russia and Romania. A new gas-fired power plant is under construction in Burlecani with the participation of Russian companies (Gazprom and Itera).

Among recent new investments in the energy sector one can note the building of the Giurgiulesti oil terminal on the Danube River. Its economic rationale remains to be proved.

Relatively advanced (yet still not satisfactory) reforms of the energy sector are the country’s key strength, apart from the natural gas transit potential. Weaknesses include lack of domestic hydrocarbon resources and ageing physical infrastructure. Key opportunities relate to pursing a more ambitious reform agenda and energy integration with the EU. Threats relate mainly to non-economic issues such as possible deterioration of relations with Russia and the internal situation (the status of Transnistria).

Russia

GDP (current USD billion)	1289.6	Average annual GDP growth 2000-2007, %	6.6
Population, million	142.1	GDP per capita (USD at PPP)	14692
Total Primary Energy Supply (TPES), Mtoe	646.7	TPES/GDP, Mtoe / 000 USD, base year 2000	1.85
Crude oil production (Mtoe)	468.7	Oil & oil products TPES (Mtoe)	133.4
Gas production (Mtoe)	515.7	Gas TPES (Mtoe)	349.6

Russia is a global energy player with the largest natural gas reserves in the world and substantial proven oil reserves. In 2006, it accounted for more than 12% of global crude oil production and about 22% of natural gas production, becoming the world's second largest producer and exporter of crude oil and the world's largest producer and exporter of natural gas. Russia is also a leading global producer and exporter of petroleum products, coal and electricity.

Following a period of rapid increase during 1999-2004, oil output has seen more modest gains more recently (around 2% annually) and such growth rate is expected to continue for at least a few more years. Russia's medium- to long-term export capacity is subject to a wide margin of uncertainty.

Natural gas production has been increasing by 1-2% annually for the last few years. Over 80% of the total production comes from Gazprom, which also controls the pipeline network and has an export monopoly. Given the ageing of its major fields and little investment in new projects until 2006, Gazprom will not see any substantial rise in production over the next few years. More recent increase in investments in production capacity should help increase output in the longer term. Substantial output increases are expected from other gas producers (e.g. oil companies that currently flare large volumes of the associated gas), but this will depend on their effective access to pipelines.

In contrast to other CIS oil and gas producers Russia controls a very well developed export pipeline infrastructure to supply the European market, although it needs maintenance and possibly expansion. It is actively pursuing a policy of limiting reliance on transit countries (mainly Ukraine and Belarus) in exports, by building new pipelines and sea terminals. Taking control of infrastructure in other countries to gain direct access to final consumers and "hitting the middlemen" policy is attractive given high retail gas prices in EU countries. The medium- to long-term export capacity is subject to wide margin of uncertainty.

For the last few years Russia has seen a strengthening of governmental control over the oil and gas sector, limiting the role of foreign investors, pushing re-negotiations of some PSAs (notably Sakhalin 2), forcing the bankruptcy of Yukos (a major private oil company) and actively supporting the state-owned companies Gazprom and Rosneft.

Among key strengths of the energy sector are Russia's massive gas and oil reserves, proximity to European and Asian markets, well developed pipeline and sea terminals network serving European markets and substantial control over the export routes for Caspian Sea region energy resources. Difficult geographical and climatic conditions in the most promising producing regions, ageing, under-invested pipeline infrastructure and an unreformed gas sector are among the major weaknesses. Opportunities relate to improving energy efficiency, curbing domestic energy demand and limiting losses, restructuring and tariff reforms in natural gas, electricity, and transmission sectors to stimulate investment, entering new energy markets (particularly in Asia) and development of the LNG technology. Risk factors are related to the consequences of fast increasing state ownership in the oil industry, a worsening FDI climate, deterioration of political relations with the EU and the impact of the continued difficult interplay between Russian foreign policy objectives, its energy policies, the interests of major oil and gas companies and its management.

Tajikistan

GDP (current USD billion)	3.7	Average annual GDP growth 2000-2007, %	8.8
Population, million	6.4	GDP per capita (USD at PPP)	1841
Total Primary Energy Supply (TPES), Mtoe	3.5	TPES/GDP, Mtoe / 000 USD, base year 2000	2.24
Crude oil production (Mtoe)	0.0	Oil & oil products TPES (Mtoe)	1.5
Gas production (Mtoe)	0.0	Gas TPES (Mtoe)	0.5

The most important element of the energy sector in Tajikistan is the hydropower stations producing virtually all electricity generated in the country. Seasonal variations in generation capacity necessitate regional trade in electricity, although this is complicated by difficult co-operation between the relevant Central Asian countries. From the perspective of Tajikistan, Uzbekistan is the key partner, also because Tajikistan imports all its natural gas from there. All petroleum products are also imported.

In the winter season electricity outages are frequent, even in the capital city. Reform progress has been minimal and in particular domestic electricity tariffs are very low.

Hydropower generation potential is the country’s key asset. Weak points include lack of reforms, ageing physical infrastructure, difficult relations with regional hydrocarbon suppliers and frequent power outages in winters. Key opportunities relate to foreign investments in new hydropower plants, reforming the electricity sector and deepening co-operation with other Central Asian countries in the gas-electricity-water sphere. Risks include further delays in energy sector reform, continued deterioration of infrastructure, climate changes and weather anomalies (limiting electricity generation options).

Turkmenistan

GDP (current USD billion)	26.9	Average annual GDP growth 2000-2007, %	14.8
Population, million	5.2	GDP per capita (USD at PPP)	5154
Total Primary Energy Supply (TPES), Mtoe	16.3	TPES/GDP, Mtoe / 000 USD, base year 2000	2.95
Crude oil production (Mtoe)	9.8	Oil & oil products TPES (Mtoe)	4.3
Gas production (Mtoe)	51.3	Gas TPES (Mtoe)	12.3

Turkmenistan probably has the Caspian Sea region's largest gas reserves and is the largest gas producer and exporter in the region. Years of economic and political self-isolation, hardly any economic reforms in the country and lack of access to export gas pipelines other than towards Russia have severely limited development of the energy sector (and the country as a whole).

Following a dramatic decline in the late 1990s the volume of gas production and exports has been on the rise in recent years, but has not reached the level of the late 1980s. Ninety percent of exports are directed to Russia and then via non-transparent deals with intermediaries partly controlled by Gazprom are mostly sold on to Ukraine. Limited quantities of gas are exported to Iran using a pipeline built back in 1997. Turkmenistan has large, though uncertain, potentially for major expansion of gas exports and pipeline infrastructure reaching final markets will be key in this process. The situation is very similar to that of Kazakhstan. One option involves intensification of sales to Russia (using the expanded Central Asia – Center pipeline). This project is strongly supported and lobbied by Gazprom. Other alternatives involve building pipelines to China or to the western coast of the Caspian Sea and then on to Europe, of which the Chinese option may be more likely to materialise following agreements signed in 2007.

Oil production potential is significantly lower and may allow some exports to regional markets, but does not matter much in total CIS exports. There are only a few relatively small-scale projects with foreign participation.

Power generation capacity (almost fully gas-fired) covers domestic demand and allow some exports, although inefficient power infrastructure leads to high losses.

Large gas reserves are the key asset of the country's energy sector. Problems arise due to limited access to gas export markets, neglected physical energy infrastructure and an unreformed economic system. Diversification of gas export routes, progress in domestic energy sector reforms (and in overall economic environment) and the attraction of FDI are the key opportunities. Risks are related to possible continued Russian control of export infrastructure, further delays in reforms and the unresolved status of the Caspian Sea.

Ukraine

GDP (current USD billion)	140.5	Average annual GDP growth 2000-2007, %	7.5
Population, million	46.1	GDP per capita (USD at PPP)	6941
Total Primary Energy Supply (TPES), Mtoe	143.2	TPES/GDP, Mtoe / 000 USD, base year 2000	3.17
Crude oil production (Mtoe)	4.4	Oil & oil products TPES (Mtoe)	14.8
Gas production (Mtoe)	17.4	Gas TPES (Mtoe)	67.4

Ukraine has one of the most energy-intensive economies in the world, partly due to the strength and steel and chemical sectors relying on under-priced energy inputs. It produces substantial volumes of natural gas and small volumes of oil and strongly relies on hydrocarbon imports from Russia or through Russian territory. At the same time it is a major transit corridor for Russian gas (and to lesser extent also oil) sales to Europe (with shares of around 80% and above 15%, respectively). The transit pipeline system is ageing, leading to technical problems in its operations.

Ukraine is a large net importer of energy resources, particularly of natural gas. It is the 5th largest natural gas consumer in Europe and despite substantial domestic production (slightly below Kazakhstani levels in 2006), it is a major importer of natural gas, currently from Turkmenistan and Russia. The terms of gas imports and gas transit have been subject to continuing bargaining between Gazprom and Ukraine, involving political dialogue at the highest levels and disagreements, leading to threats of supply disruptions. These relations are highly non-transparent. In particular the role of intermediaries, such as RosUkrEnergo, controlled by Gazprom and Ukrainian entities, which until recently accounted for the bulk of Ukrainian gas imports originating in Turkmenistan, has raised several doubts. Since 2006 gas import prices have increased substantially, although are still staying below import prices in most EU countries.

Oil plays a limited role in energy balances, with a share of under 15%. Seventy-five percent of this is imported, mainly from Russia. The refining sector has been privatised, with strong participation of Russian companies. Several refineries are currently being modernised to improve product quality.

Ukraine has large power generating capacity – with a large role of nuclear energy (almost double domestic demand) and exports electricity to Russia and EU countries. Exports to the latter group are limited by the fact that Ukraine's power grid is not connected to the UCTE system and is synchronized with Russia. Besides, the transmission and distribution systems are in need of investment and maintenance.

Despite limited hydrocarbon resources, the Ukrainian energy sector has several strong points including a well developed gas and oil transit infrastructure, favourable geographical location, large gas storage facilities, substantial power generation and oil refining capacity. Weaknesses are related to very limited reforms in the sector, energy inefficiency, ageing physical infrastructure and a high dependence on energy imports. Domestic energy sector reforms (including tariffs), an improved investment climate and privatization are among key development opportunities. Risks are related to delays in necessary domestic reforms, the consequences of continued unpredictability of gas import prices and conditions and further deterioration of physical infrastructure.

Uzbekistan

GDP (current USD billion)	22.3	Average annual GDP growth 2000-2007, %	6.3
Population, million	27.4	GDP per capita (USD at PPP)	2344
Total Primary Energy Supply (TPES), Mtoe	47.0	TPES/GDP, Mtoe / 000 USD, base year 2000	2.62
Crude oil production (Mtoe)	6.0	Oil & oil products TPES (Mtoe)	5.7
Gas production (Mtoe)	49.0	Gas TPES (Mtoe)	39.8

Uzbekistan has large gas reserves and for the last few years its gas output has been at levels similar to Turkmenistan, although exports have been much lower. Lack of economic reforms and an unfavourable investment climate have hampered the development of the energy sector.

Large domestic gas consumption and very high losses due to a deteriorated pipeline network do not currently allow any more significant increase in exports. Apart from gradually increasing exports to Russia, Uzbekistan has been supplying Kazakhstan, as well as Kyrgyzstan and Tajikistan (as part of an agreement with these neighbouring countries under which they operate their hydropower plants in the "irrigation mode", releasing water in summer that is needed for the Uzbek cotton growing industry; the agreement also involves electricity trade). Some increase in

Uzbek gas exports is possible and the most likely direction of these additional sales would be to Russia.

Uzbekistan is a net importer of oil, with output stagnant or declining for the last few years. Foreign investors are present in only a few small upstream projects.

Gas is a key input in electricity production. Despite high nominal generation capacity, actual production is well below it, reflecting the ageing of many large plants and transmission lines and the need for extensive rehabilitation.

Substantial gas reserves, uranium deposits and substantial power generation capacity are the key asset of the country's energy sector. The problems arise due to limited access to gas export markets, a deteriorated physical energy infrastructure and unreformed economic system. Energy saving, progress in domestic energy sector reforms (and in the overall economic environment), the attraction of FDI and diversification of gas export routes are the key opportunities. Risks are related to further delays in reforms and possible continued Russian control over export infrastructure.

Резюме

В настоящем докладе анализируются макроэкономические аспекты развития энергетического сектора в странах Содружества независимых государств (СНГ). В нем также рассматриваются отдельные аспекты отношений между ЕС и СНГ в области энергетики как с точки зрения потенциала стран СНГ в сфере поставок энергоресурсов в ЕС, так и вариантов проведения энергетической политики в странах СНГ.

Энергетика является ключевым сектором, имеющим решающее значение для развития и макроэкономической стабильности ряда стран СНГ. В течение последних лет внутренняя динамика развития сектора энергетики в СНГ, макроэкономические показатели этих стран и перспективы сотрудничества в энергетической сфере между ЕС и СНГ формировались под влиянием несколько факторов. Настоящий доклад посвящен анализу этих вопросов.

Вероятно, важнейшим фактором является быстрый рост мировых цен на нефть. Достигнув рекордно низкого уровня в 1998 году (10-15 долл. США за баррель), цены выросли почти до 30 долл. США за баррель в течение 2001-2003гг., после чего начался их быстрый взлет, и они превысили 100 долл. США в начале 2008 года. В силу механизма формирования цен на природный газ, применяемого к импорту ЕС из России, это привело к аналогичному взлету цен на природный газ. В результате, цена российского газа на границе с Германией возросла почти втрое в период 2002 – 2007 гг., составив более чем 300 долл. США за тысячу кубических метров в конце 2007 года и свыше 350 долл. США в начале 2008 года. В свою очередь, это привело и к значительному росту цен на газ в торговле между странами СНГ, которые до 2005 года оставались на искусственно низком уровне. Возникшее напряжение между импортерами газа, которые пытаются остановить или замедлить рост цен, и экспортерами газа, в первую очередь, России (а также между различными «группами интересов», которые пытаются максимизировать свои рентные доходы), увеличило понимание о неопределенности поставок газа также и в ЕС.

Энергетический сектор и его макроэкономическое значение в СНГ

Глава 3 посвящена качественному и количественному анализу макроэкономического значения энергетического сектора в странах СНГ. Регион СНГ является одним из крупнейших мировых производителей энергии, обеспечивающим около 15% мирового экспорта нефти и свыше 25% экспорта газа. В 2006 году на него приходилось 10% мировых доказанных запасов нефти и 32% запасов газа. Основная часть этих запасов принадлежит России, однако в будущем Казахстан также имеет шанс присоединиться к группе крупнейших мировых производителей нефти.

Роль энергетического сектора в экономике стран СНГ сильно различается в зависимости от страны. По нашим приблизительным оценкам, в 2005 году энергетический сектор составлял самую высокую долю в ВВП Азербайджана – свыше 35%. В Казахстане и Туркменистане соответствующая доля превышала 15%, а в России была немного ниже 15%. Доля ВВП Беларуси, Украины и Узбекистана составляли между 5% и 15%, а в остальных странах СНГ доля энергетического сектора была ниже 5%.

Энергоресурсы составляют основную статью экспорта в ряде стран СНГ. В Азербайджане их доля превышает 80% всего экспорта, достигает около 70% в Казахстане и 60% в России. Более ранние данные по Туркменистану также свидетельствуют о долях в диапазоне 60-

80%. В Беларуси, с ее развитым сектором нефтепереработки, основанной на российской нефти, нефтепродукты составили чуть менее 40% суммарного экспорта. В остальных странах порядки показателей ниже – около 20% в Армении (электроэнергия) и менее 10% в других странах СНГ. Нефть и газ являлись главными факторами общего роста экспорта в основных странах-производителях (Россия, Казахстан и Азербайджан) по крайней мере до 2005 года, после чего их роль несколько снизилась.

Энергоносители также являются основным элементом статей импорта в экономике ряда стран СНГ. В 2005 году они составляли около 30% импорта Беларуси, Украины и Кыргызстана и свыше 15% в Молдове, Грузии, Таджикистане и Армении. Это свидетельствует об уязвимости данных стран к скачкам цен на энергию.

Добыча, экспорт, перевозка и переработка энергоносителей являются источником значительных бюджетных поступлений. В 2006 году они составляли более половины доходов государственного бюджета Азербайджана, в то время, как в России они давали немногим менее половины федерального бюджета (11% ВВП; доля в общегосударственных доходах приближалась к одной трети). В Казахстане нефтяные доходы (10% ВВП) составляли немного более одной трети общегосударственных доходов в 2005-2006 гг. В Беларуси сектор нефтепереработки и другая деятельность, связанная с сектором энергетики (транзит нефти и газа и т.п.), оценивались на уровне 20% общегосударственных доходов в 2006 году.

Энергетический сектор СНГ привлекает значительный объем прямых иностранных инвестиций (ПИИ) и во многих странах является основной целью иностранных инвесторов. В первой половине 2007 года несколько крупных приобретений в российской электроэнергетической и газовой промышленности вывели инвестиции в энергетический сектор на уровень, превышающий 28 миллиардов долларов США, - около 60% суммарного притока ПИИ за тот же период. В предыдущие годы доля энергетического сектора в суммарных потоках ПИИ колебалась от 10% до 25%. В Азербайджане и Казахстане инвестиции в нефтегазовый сектор доминируют в суммарном объеме ПИИ. В некоторых других странах СНГ проекты в энергетическом секторе также привлекали значительные средства (например, российские инвестиции в Беларуси, связанные со строительством газопровода «Ямал-Европа»), однако, в целом, их роль была менее заметной.

Большинство стран СНГ являются довольно неэффективными потребителями энергии, по сравнении со странами ОЭСР, при расчетах на основе номинального ВВП. В 2005 году Украина потребила в 10 раз больше энергии в расчете на 1 доллар ВВП, чем в среднем по странам ОЭСР (и почти вчетверо больше, чем Китай). Сравнения выглядят несколько лучше при расчете уровней ВВП, пересчитанным по курсам обмена валют, основанным на паритете покупательной способности (ППС). При таком расчете Украина нуждается в количестве энергии на единицу ВВП, почти втрое превышающем потребности региона ОЭСР (и в 2,3 раза больше, чем Китай), а Армения и Грузия находятся на среднем уровне ОЭСР. Потребление энергии на душу населения в СНГ значительно ниже среднего уровня по ОЭСР во всех странах СНГ, кроме России. Уровни эмиссии CO_2 существенно разнятся среди стран СНГ, будучи очень высокими в Казахстане, России и Туркменистане, по сравнению с относительно низкой эмиссией в Армении, Грузии, Кыргызстане и Таджикистане.

Начиная с 2005 года, цены на российский, а затем и на каспийский газ, экспортируемый в страны СНГ, начали расти с очень низкого уровня, вслед за резким скачком на рынке ЕС. Этот факт имел серьезные последствия во многих отношениях. Во-первых, в прошлом цены ниже рыночных служили основным фактором, лежавшим в основе неоптимальной промышленной структуры стран-импортеров, и как таковые любые повышения цен на газ должны способствовать исправлению такой ситуации, создавая стимулы для энергосберегающих реформ, и повышению благосостояния. Во-вторых, субсидирование потребителей в СНГ создавало значительные финансовые потери для Газпрома, которые еще более выросли после повышения цен на энергоносители в ЕС, и, с этой точки зрения, изменение политики Газпрома имеет чисто экономическую подоплеку. С другой стороны, новая ценовая политика Газпрома (и методы ее реализации) дает некоторые основания для обвинений с той точки зрения, что ценообразование на газ стало инструментом поощрения или наказания отдельных стран СНГ, в зависимости от их политики по отношению к России, в целом, и к Газпрому, в частности. К началу 2008 года цены по-прежнему существенно разнились среди стран-импортеров СНГ (тарифы для Грузии и Молдовы почти вдвое превышают тарифы для Армении и Беларуси).

Энергетический бум в крупнейших странах СНГ, являющихся производителями энергоносителей (в основном, России), оказывает влияние на перспективы роста других стран СНГ, однако значение этого побочного эффекта с трудом поддается оценке. Имеются свидетельства, доказывающие, что каналы торговли и инвестиций не играют достаточно сильной роли. Напротив, растущий спрос, в основном, на неквалифицированную рабочую силу в России, возможно, играет здесь наиболее важную роль, и денежные переводы из России имеют существенное значение для экономического роста Армении, Грузии, Молдовы и стран Средней Азии.

Основные макроэкономические проблемы, связанные с функционированием энергетического сектора

В Главе 4 рассматриваются определенные макроэкономические проблемы, связанные с конкретными характеристиками энергетического сектора в странах СНГ.

Первый вопрос заключается в следующем: может ли богатство энергетических ресурсов рассматриваться как позитивный или негативный фактор при оценке долгосрочных перспектив развития стран СНГ – экспортеров энергии? В исторической перспективе, ряд стран, имеющих богатые запасы природных ресурсов, в частности нефти и газа, испытывали периоды низких темпов экономического развития, и, видимо, их общий уровень развития ниже того, который можно было бы ожидать с учетом богатства их минеральных ресурсов или фактической стоимости экспортных доходов, полученных за последние десятилетия. Данное эмпирическое наблюдение привело к созданию расхожего понятия «ресурсное проклятие», которое является характеристикой ситуации, когда страны, имеющие большие запасы природных ресурсов, не умеют воспользоваться этим богатством наилучшим образом.

Хотя большая часть эмпирических данных действительно свидетельствуют о весьма негативном влиянии ресурсозависимости или изобилия ресурсов на долгосрочное развитие и уровень доходов на душу населения, эти данные не всегда являются достаточно надежными и зависят от анализируемого периода. Кроме того, по некоторым признакам, последнее десятилетие, фактически, стало гораздо более благоприятным для стран, богатых нефтью и газом, чем предыдущие периоды. Отчасти, эти более высокие результаты могут быть связаны с совершенствованием уровня регулирования нефтяных сверхприбылей, после, зачастую шоковых, экспериментов 1970-х и 1980-х годов.

В стратегическом плане, основной вопрос заключается в механизме, посредством которого природные ресурсы могут оказывать влияние на экономический рост, а также в политических и/или иных факторах, которые могут помочь странам избежать ресурсного проклятия или превратить его в благословение.

В литературе можно найти упоминание основных механизмов, вызывающих негативные последствия нефтегазовых бумов на перспективы долгосрочного развития, которые включают колебания цен на нефть, «голландскую болезнь», деградацию политической системы, деградацию государственных институтов, негативные политико-экономические последствия и недоинвестирование в человеческий капитал.

Определен ряд стратегий, способных ограничить потенциально негативные последствия ресурсного богатства и максимизировать потенциальные выгоды. В их числе – соответствующая налоговая политика (см. далее), последовательная поддержка неэнергетических секторов экономики, инвестиции в человеческий и материальный капитал, преодоление чрезмерного неравенства доходов, укрепление связей между государством и обществом, расширение участия в принятии решений, повышение прозрачности и подотчетности, а также другие меры укрепления демократических механизмов и системы сдержек и противовесов. Все эти рекомендации требуют долгосрочных и систематических реформаторских усилий.

В контексте СНГ мы можем сделать вывод, что на сегодняшний день отсутствуют какие-либо негативные последствия из-за обеспеченности энергетическими ресурсами. Фактически, экспорт нефти в регионе СНГ позитивно влияет на развитие, в особенности, в последние годы. Основная проблема связана с его последствиями в долгосрочной перспективе, в особенности через политические каналы и механизмы государственного управления. Обнаруживается ряд признаков, вызывающих опасения, однако обнадеживающих факторов больше. В общем плане, развитие демократии и гражданского общества в странах с богатыми энергетическими ресурсами почти всегда сталкивается со значительными проблемами, даже в сравнении с другими странами СНГ, где ситуация (и тенденции) далеко не удовлетворительны. С другой стороны, качество экономического управления, эффективность макроэкономической политики и прогресс в определенных областях экономических реформ, по крайней мере, в России и Казахстане, видимо, сильнее, чем в других странах СНГ. Пока еще рано делать вывод относительно того, станут ли нефть и газ благом или проклятием для стран СНГ, и еще остается достаточное пространство для маневра при выборе соответствующими странами модели развития и управления.

С чисто экономической точки зрения, результаты эмпирического анализа, представленные в Разделе 4.3, могут указывать на некоторые, хотя не особо серьезные, симптомы голландской болезни, такие, как связь между ценами на нефть и повышением номинальной и реальной стоимости национальных валют стран СНГ и снижение доли обрабатывающей промышленности в ВВП. С другой стороны, отсутствует корреляция между ценами на нефть и относительными ценами на неторгуемые товары, что ставит под сомнение функционирование эффекта движения ресурсов и эффекта расходов.

Имеющиеся краткие подборки статистических данных, а также влияние других, иногда весьма фундаментальных, факторов требуют очень тщательной интерпретации результатов. В числе этих прочих факторов можно упомянуть текущий процесс реструктуризации, протекающий в экономике всех стран СНГ, унаследовавших огромные структурные диспропорции, в особенности, в процессе индустриализации. В силу этих причин довольно трудно провести различия между снижением доли обрабатывающих отраслей, вызванным «голландской болезнью», связанной с нефтедобывающим сектором, и более общей тенденцией закрытия или сокращения многих пост-советских промышленных предприятий, которые не смогли выжить в обстановке конкуренции.

В плане оценки реального обменного курса валют, бывает довольно трудно отделить последствия чисто «голландской болезни» от коррекции первичной валюты, подлежащей оценке (в особенности, после серии финансовых кризисов 1998-1999 годов), и прочих факторов влияющих на тенденцию реального валютного курса (например, эффект Balassa-Samuelson).

Отсутствие «ресурсного проклятия» и весьма слабые свидетельства наличия «голландской болезни» могут быть отчасти объяснены разумной и ответственной бюджетно-налоговой политикой, вызвавшей бюджетные сверхприбыли, в частности в Казахстане и России (в значительно меньшей степени в Азербайджане). Недостаток данных о доходах бюджета, связанных с нефтью и газом, не позволяет произвести аналогичный анализ в отношении Туркменистана и Узбекистана, хотя некоторые другие наблюдения, в частности, связанные с квази-финансовой деятельностью (см. далее) указывают на то, что эти две страны продолжают вести популистскую политику.

Разумная финансово-бюджетная политика Казахстана и России поддерживается прогрессивными институциональными механизмами, такими как специализированные нефтяные стабилизационные фонды и законы, предусматривающие резервирование и сбережение «на черный день» доходов от высоких цен на нефть и газ, а также расширение производства энергоресурсов.

К сожалению, Азербайджан, будучи первой страной СНГ, создавшей Государственный нефтяной фонд (SOFAZ) еще в декабре 1999 года, не попадает под характеристику страны, проводящей сбалансированную налогово-финансовую политику. Напротив, практически беспрецедентные темпы финансовой экспансии в последние годы и очевидные симптомы экономического перегрева создадут серьезные проблемы в ближайшем будущем. Кроме того, добыча нефти в этой стране достигнет пика в последующие несколько лет, после чего прогнозируется постепенное снижение добычи.

Кроме того, до сих пор вполне разумная налогово-финансовая политика России также была несколько подпорчена политически мотивированной (предвыборной) финансовой интервенцией в конце 2007 года. Остается только ждать, чтобы проверить, может ли это послабление быть легко исправлено в ближайшем будущем, так как это утверждают ведущие российские официальные лица.

Можно ожидать, что стабильно высокие цены на энергоносители (наиболее вероятный глобальный сценарий) будут «искушать» политиков во всех странах, являющихся предметом анализа, расходовать более высокую долю доходов от нефти и газа на внутренние нужды, вместо того чтобы сберегать их за границей, Политикам будет все труднее доказывать, что «нормальная» долгосрочная цена на нефть будет оставаться на уровне 20-30 долларов за баррель, – предельном значении, принятом правилами большинства стабилизационных фондов. В случае реализации такого сценария, угроза «голландской болезни» и другие симптомы «ресурсного проклятия» могут стать неизбежными.

Кредитно-денежная политика, - второй элемент макроэкономической политики, - не может похвастаться такими же успехами, как бюджетно-налоговая политика. Несмотря на то, что в странах СНГ темпы инфляции в первой половине 2000-х годов замедлились, достижения в данной сфере были не особенно впечатляющими (несколько стран так и не смогли привести инфляцию к однозначной величине). В последнее время, ситуация в данной сфере еще более ухудшилась под действием растущего инфляционного давления. Если в 1990-х годах кредитно-денежный дисбаланс и внутренняя кредитная эмиссия были основными источниками инфляционных рисков, то в текущем десятилетии главная угроза исходит от активного сальдо платёжного баланса и ускоренного накопления международных резервов. Это явление, в значительной степени, является результатом энергетического и товарного бума, оказавшего благоприятное воздействие на экономику ряда стран СНГ.

Большинству центральных банков стран СНГ не удалось справиться с этими новыми проблемами должным образом. Они уделяли слишком большое внимание противодействию реальному и номинальному повышению курса валют и слишком мало – снижению уровня инфляции. Кроме того, привязка к доллару США, использовавшаяся некоторыми из них для искусственного поддержания курса национальных валют, как оказалось, способствует росту инфляции, в особенности в последний период времени. Поскольку глобальное инфляционное давление вряд ли прекратятся в ближайшем будущем, центральным банкам СНГ придется пересмотреть свою монетарную стратегию. Им следует либо изменить валютно-финансовую привязку и допустить единовременную корректирующую переоценку, либо ввести в действие стратегии прямого планирования уровня инфляции, допускающие свободно плавающий курс национальных валют.

Изобилие энергетических ресурсов способно также спровоцировать их неэффективное внутреннее использование, включая скрытое субсидирование и взаимное субсидирование потребителей энергии или их определенных категорий, главным образом, домашних хозяйств. Советское наследие в этой сфере является особенно негативным, связанное с глубокой недооценкой энергоресурсов и перекрестным субсидированием, приводящим к огромным искажениям энергетических тарифов. Крайне высокая инфляция и даже эпизодическая гиперинфляция в начале 1990-х годов еще более осложнила эту ситуацию.

Эмпирические данные, анализируемые в Разделе 4.5, подтверждают, что большинство стран СНГ продолжали осуществлять крупномасштабную квази-фискальную деятельность (КФД) через энергетический сектор в течение достаточно длительного времени. Эта деятельность предполагает недооценку энергоресурсов, перекрестное субсидирование (обычно, в пользу домашних хозяйств), терпимость к задолженности и громадным потерям при передаче энергии и в системах распределения. Такая политика вызвала глубокую техническую деградацию существующих мощностей для генерирования электроэнергии и тепловой энергии, а также сетей передачи и распределения электричества и газа, и привела к прекращению инвестиций в этих сектора.

Энергозависимые страны, импортирующие энергоресурсы, такие, как Армения, Грузия и Молдова, первыми реформировали, частично приватизировали и реструктурировали свои энергетические сектора и практически искоренили подобную квази-фискальную деятельность. Другие страны, в том числе богатые энергоресурсами Казахстан и Россия, также недавно вступили на этот путь. Наиболее высокий масштаб КФД сохраняется в Таджикистане, Узбекистане, Азербайджане и Кыргызстане (вероятно, также в Туркменистане, однако недостаток информации затрудняет оценку).

Рассматривая социальные аспекты энергетического бума, можно отметить, что не обнаружено никаких свидетельств того, что он способствовал сокращению неравенства в доходах и благосостоянии, хотя невозможно и утверждать обратное, т.е., что неравенство в доходах и благосостоянии увеличилось в результате энергетического бума. Кроме того, необходимо провести глубокий и всесторонний анализ для того, чтобы получить более ясную картину распределения доходов от нефти и газа среди различных групп населения и регионов. Помимо каналов бюджетно-финансового и корпоративного перераспределения, существенная роль также принадлежит неформальному сектору, глубоко укоренившемуся в экономической практике стран СНГ.

Роль СНГ в поставках энергии в ЕС

В Главе 5 анализируется текущее и потенциальное значение региона СНГ в поставках энергоносителей в ЕС. При этом принимаются во внимание существенные различия между государствами ЕС в плане зависимости от импорта нефти и газа, диверсификации направлений импорта энергии и их потребности в поставках энергоресурсов из России и других стран СНГ.

Главный вопрос заключается в том, в какой степени могут вырасти добыча нефти и газа и их экспорт из СНГ и какой объем этих энергоресурсов (в частности, природного газа) будет направляться в страны ЕС. В случае нефти, с учетом глобального характера рынка, суммарный экспортный потенциал СНГ влияет на глобальные цены на нефть, однако направления экспорта имеют меньшее значение. Иное дело с природным газом, где трубопроводы, в значительной степени, определяют, какой объем можно перекачать и куда.

Спрос на нефть в ЕС, в основном, стабилен, но снижение внутренней добычи означает, что зависимость от импорта (и так высокая, при том, что более 80% потребляемой нефти импортируется) постепенно увеличивается и превысит 90% в 2020-х годах. В течение последних нескольких лет наблюдается стабильный рост потребности ЕС в газе, и прогнозируется ее дальнейшее увеличение в следующие примерно два десятилетия. С учетом мало обнадеживающих перспектив внутренней добычи, зависимость от импорта газа должна вырасти с современного скромного уровня менее 60% до более, чем 80% в 2020-х годах. Следует помнить, что эти совокупные цифры скрывают существенные различия среди стран ЕС. Существует лишь несколько стран, добывающих существенные объемы нефти и газа (в основном, Нидерланды, Великобритания и Дания), а большинство считают уровни своей зависимости от импорта нефти и газа близкими к 100%.

Более того, степень диверсификации импорта нефти и газа и, в частности, зависимость от поставок из России и СНГ, существенно разнятся по странам ЕС. Внутренне потребление ряда стран (в особенности, Страны Балтии, Финляндия, Словакия и Болгария) почти полностью зависит от российского газа. Эти и некоторые другие восточноевропейские страны имеют ограниченные возможности диверсификации своих поставок газа в случае необходимости. Напротив, ситуация на европейском нефтяном рынке такова, что, несмотря на доминирование российского импорта в ряде стран, существующая транспортная инфраструктура и развитый спотовый рынок позволяют быстро переходить на альтернативные источники поставок.

В период между 2000 и 2006 годами импорт газа в ЕС из России возрос минимально, а доля России в совокупном объеме импорта газа ЕС27 снизилась с 49% примерно до 39%. Напротив, импорт нефти в ЕС из России в период 2000 - 2006 годов резко возрос, а ее доля в суммарном объеме импорта ЕС 27 увеличилась с 19% приблизительно до 32%. В 2006 году на каспийские нефтедобывающие страны приходились скромные 5% суммарного импорта нефти, а их поставки газа были минимальными.

Для России, на которую приходится 80% общей добычи и экспорта нефти и газа СНГ, рынки ЕС представляют основной канал экспорта сырой нефти (50%), нефтепродуктов (33%) и газа (70%), а также являются главными источниками экспортных доходов.

Будущие объемы добычи нефти и газа, внутреннего потребления и тенденции экспорта России и других нефтедобывающих стран СНГ являются весьма неопределенными. Что касается России, прогнозы до 2020 года находятся в диапазоне 150-310 миллионов тонн экспорта нефти и 185-310 миллиардов кубических метров экспорта газа. Главными определяющими факторами будущих тенденций являются экономические факторы (инвестиции в добывающие и транспортные мощности, рост внутреннего рынка), вопросы регулирования (доступ к добывающим мощностям и трубопроводам для независимых добывающих предприятий, определение внутренних цен), а также развитие эффективной энергетической политики и технических факторов (использование новых технологий для увеличения объема добычи).

В Каспийском регионе потенциал нефтяного экспорта Казахстана и Азербайджана к 2020 году может составить 125-175 миллионов тонн. Потенциал экспорта каспийского и, в особенности, туркменского газа крайне трудно прогнозировать с какой-либо степенью определенности. Все определяющие факторы экспортных тенденций, упомянутые в случае России, также относятся к Каспийскому региону, и транспортная инфраструктура может оказаться в числе ключевых факторов, в силу замкнутого сушей местоположения основных добывающих предприятий и ограниченной пропускной способности существующих трубопроводов к потенциальным рынкам, кроме российского.

Другой вопрос: какой объем будущего экспорта нефти и газа СНГ достигнет рынков ЕС? В случае России, мы полагаем, что ЕС останется основным рынком экспорта газа, и любая переориентация продаж, первоначально запланированных в ЕС, маловероятна. Постепенная экспансия на рынки Азии будет основана на разработке новых месторождений, которые в любом случае слишком удалены от Европы, чтобы поставки туда могли быть экономически рентабельными. В течение следующих двух десятилетий экспорт российского газа в ЕС, вероятно, останется в пределах 150-200 миллиардов кубометров.

Будущие направления экспорта газа из региона Каспийского бассейна являются несколько менее определенными. В настоящее время только Туркменистан экспортирует большие объемы газа, которые, в основном, поставляются в Украину (по контракту между Туркменистаном и Газпромом). Азербайджанский газ (с месторождения Шах Дениз) начал поступать Турцию в середине 2007 года, и в течение ближайших лет объемы, вероятно, увеличатся, хотя по-прежнему останутся ничтожными в масштабах ЕС. Более существенные объемы каспийского газа могут попасть на рынки ЕС через Россию. Шансы поставок значительных объемов каспийского газа на рынки ЕС по трубопроводам, независимым от России, на данном этапе представляются слабыми. Еще одним амбициозным проектом в данной области является трубопровод Набукко, который должен связать Эрзурум в Турции с австрийским газовым узлом Баумгартен. Он способен обеспечить доставку туда до 30 миллиардов кубических метров газа к 2020 году. Исходя из того, что газ Каспийского бассейна должен обеспечить основную часть этого объема, необходимо построить Транскаспийский трубопровод, связывающий газодобывающие регионы Туркменистана и Казахстана с Баку – исходным пунктом уже существующего трубопровода Баку – Тбилиси – Эрзурум. В настоящее время перспективы Транскаспийского трубопровода или любого связующего звена между регионом Каспийского моря и Турцией через Иран являются неопределенными.

Среди рисков, связанных с энергоснабжением ЕС из СНГ, можно назвать снижение производства и повышение внутреннего энергопотребления в России и в других странах СНГ, срывы поставок, вызванные износом трубопроводов, а также региональными или внутренними политико-экономическими кризисами, а также потенциально монополистической политикой Газпрома, принимая во внимание расширение его владения различными элементами цепочки газоснабжения, включая сегменты передачи и распределения в ЕС. Цель ЕС заключается в принятии общей энергетической политики, внешнее измерение которой должно предусматривать мощный элемент, предполагающий отношения с СНГ, что может увеличить безопасность поставок энергоносителей из данного региона. Реализация такой политики будет непростой задачей и, помимо политической воли, потребует создания соответствующей организационной и регулятивной инфраструктуры.

Долгосрочные газовые контракты, заключенные в 2006 году, предусматривают поставки в объеме, превышающем 100 миллиардов кубометров российского газа различным потребителям ЕС в период до примерно 2030 года. Это означает, что долгосрочные контракты будут оставаться главным договорным вариантом для обеспечения импорта газа в ЕС из России, по крайней мере, в пределах указанного временного горизонта.

Покупка и транзит природного газа между импортерами ЕС и поставщиками, не являющимися государствами-членами ЕС, определяются двусторонними договорами (контрактами), в отсутствие какого-либо общего регулирующего акта, кроме Европейской энергетической хартии. В случае взаимоотношений между ЕС и Россией, значение такой договорной основы ограничено, поскольку Россия не ратифицировала Договор Европейской энергетической хартии (ДЕЭХ) и едва ли ратифицирует ее, если не будет достигнут более широкий компромисс, который включал бы, в какой-то мере, положения Транзитного протокола, вводящий в действие положения ДЕЭХ в отношении транзита энергоресурсов.

Стратегически-политические варианты развития энергетического сектора в регионе СНГ

В Главе 6 дается описание действующей регуляторной и институциональной среды энергетического сектора, а также определяются ключевые вызовы и проблемы, которые в настоящее время сдерживают его развитие, либо которые могут представлять собой преграду будущему росту, с учетом дальнейших социально-экономических последствий. Далее рассматриваются потенциальные пути решения данных проблем, производится попытка анализа текущей внутренней политики и, в соответствующих случаях, - потенциальной роли внешних партнеров, в особенности , ЕС.

Современное состояние энергетического сектора в СНГ, с одной стороны, определяется ранее существующими условиями, т.е., специфическими характеристиками инфраструктуры и центральным планированием, унаследованным от советского периода, а также, с другой стороны, – проводимой с середины 1990 годов политикой реформ, которая имела неоднозначные результаты.

Можно выделить ряд факторов, определивших преобразования в энергетическом секторе и их динамику. Во-первых, советское наследие сравнительно развитой энергетической инфраструктуры (хотя и, в основном, устаревшей), а также значительное снижение энергопотребления в результате экономического спада 1990-х годов, задержали реализацию широкомасштабных и необходимых реформ, способствуя использованию скорых и временных решений. Во-вторых, превалирующее общественное восприятие снабжения электроэнергией, газом и другими коммунальными услугами как права, а не как услуги, которая должна быть приобретена по цене, отражающей издержки производства, существенно затрудняет повышение тарифов в политическом плане. В-третьих, присутствие вертикально интегрированных монополий, распространяющих влияние за пределами энергетического сектора, сильно затрудняет проведение реформ коммунальных служб даже в развитых странах (о чем свидетельствуют проблемы ЕС в данной сфере), превращая задачу, стоящую перед менее экономически развитыми странами СНГ, в поистине трудноразрешимую. В-четвертых, политические конфликты между некоторыми странами СНГ, отсутствие культуры эффективного международного сотрудничества, а в некоторых случаях – также недостаток транспортной инфраструктуры, - снижают потенциальные выгоды от торговли энергоресурсами, а в более широком плане – от сотрудничества в области энергетики в данном регионе. Примером этому может служить неспособность найти эффективные и стабильные решения проблемы взаимозависимости в области регионального снабжения водой, газом и электроэнергией в отношениях между странами Средней Азии. В-пятых, правительства по-прежнему имеют склонность аккумулировать функции определения политики и исполнения регулятивных задач (при наличии слабых регулятивных институтов), а также функции контроля собственности государственных компаний. Такая концентрация власти приводит к конфликтам интересов, политическому вмешательству, а также затрудняет реформы. Кроме того, во многих странах СНГ существуют тесные личные связи между политическим руководством и управляющими энергетического сектора.

Наконец, с точки зрения сегодняшнего дня, длительный период значительного недоинвестирования в энергетическую инфраструктуру, в сочетании с крупным экономическим подъемом в регионе начиная с 2000 года (и соответствующим ростом спроса на энергию), создают возможность энергетического кризиса в будущем, что ставит под угрозу надежность и качество услуг в среднесрочной перспективе. Государственные вертикально интегрированные газовые и электрические монополии, или олигополии, все более доминируют на рынках и контролируют инфраструктуру, что существенно препятствует появлению конкурентных рынков. Энергоотдача остается на низком уровне, в то время, как неэффективное корпоративное управление и недостаточная прозрачность еще в большей степени ухудшают инвестиционный климат. Эти явления совпали с существенным повышением мировых цен на товары.

Среди трех основных энергетических субсекторов, рассматриваемых в настоящем Докладе, реформы в секторах переработки нефти и сбыта нефтепродуктов, вероятно, наиболее продвинуты, что отражает глобальный характер нефтяного рынка, менее сложную нормативно-правовую базу, большую гибкость инфраструктуры транспортировки нефти и участие частного сектора. В то же время, тенденция усиления государственного участия в данных секторах очевидна в России и Казахстане, а также, в определенной степени, - в Азербайджане. Наступательные внутренние стратегии по отношению к иностранным инвесторам дают основания полагать, что правительства стран СНГ не могут противостоять искушению изменить условия договоров, согласованные в 1990-е годы, когда цены на нефть были низки, а политическое и экономическое положение государств СНГ по отношению к иностранным компаниям было гораздо слабее, чем сегодня. Результаты такого изменения политики еще дадут себя знать в будущем. В случае России, таковыми могут стать отрицательные последствия для производства и потенциального увеличения экспорта.

Ход реформ в секторе производства электроэнергии является неоднозначным, при том, что в ряде стран (России, Армении и большинстве других европейских стран СНГ) наблюдается значительный прогресс и многообещающие перспективы, которые контрастируют с менее успешными реформами и даже полным их отсутствием в Средней Азии и Беларуси. Создание эффективных регулирующих органов, функционирующих рынков электроэнергии и реформы тарифов оказались наиболее трудными элементами пакета реформ.

Газовая промышленность подверглась наименьшим реформам. Это можно отнести за счет особого положения Газпрома в России, сильной зависимости от газа при производстве электроэнергии в ряде стран СНГ, сложной комбинации политических и энергетических взаимоотношений между странами СНГ и концентрации газовых ресурсов (помимо России) в отдаленных внутриконтинентальных странах с наименее реформированной экономикой (Туркменистан и Узбекистан). Государственные вертикально интегрированные газовые монополии, объединяющие коммерческие и регулирующие функции, удерживают жесткий контроль над инфраструктурой сектора, создавая значительные препятствия для доступа третьих сторон в лице новых компаний к сети трубопроводов. Цены по-прежнему устанавливаются государством ниже уровня себестоимости, и взаимное субсидирование является общепринятой практикой, несмотря на неоднократное повышение цен, в том числе, в России.

Внутренние реформы в энергетическом секторе также связаны – и зачастую довольно тесно, – со стратегиями производства и экспорта основных стран-производителей и крупнейших компаний, таких, как Газпром, а также стратегиями нынешних и будущих стран транзита.

Все участники данного процесса стараются максимизировать краткосрочные прибыли от возможностей текущего и будущего производства, экспорта и транспортировки. Эти цели зачастую противоречат интересам стран-импортеров ЕС. Основные производители стремятся повысить свои рыночные возможности, расширить свои права в плане установления цен и использовать возможности, предоставляемые монопольным контролем над существующей транспортной инфраструктурой. Кроме того, реформы внутренних цен будут четко влиять на экспортные стимулы, связанные с расширением внутреннего рынка. Транзитные страны заинтересованы в максимизации потока ресурсов, проходящего через их территории. Эти стратегии могут в некоторых случаях оказывать пагубное воздействие на долгосрочное развитие внутреннего энергетического сектора, поскольку они ограничивают конкуренцию, отрицательно влияют на принятие решений об инвестициях и способствуют неэффективному использованию энергии. Вышеуказанные факторы вряд ли исчезнут в ближайшее время, поэтому их необходимо учитывать при выборе вариантов реформирования данного сектора.

Например, российские власти стремятся восстановить контроль над производством и экспортом энергии в странах СНГ посредством долгосрочных соглашений о закупке (со странами Средней Азии), прямых инвестиций (в основном, в перерабатывающие и сбытовые компании), а также, в некоторых случаях, за счет использования энергетического давления. Газпром – основной двигатель российской внешней энергетической стратегии, - существенно расширил непосредственный контроль над цепочкой газовых поставок (разработкой, транспортировкой/транзитом, переработкой, продажей, распределением) в странах СНГ, а также ЕС. Новые крупномасштабные и очень дорогостоящие проекты газопроводов (Северный поток, Южный поток) имеют целью непосредственно связать Россию с основными европейскими газовыми рынками в обход существующих транзитных маршрутов, которые предполагают определенный «транзитный риск» для Газпрома. Эти проекты могут ограничить экономическую целесообразность альтернативных проектов трубопроводов, в частности, Набукко, которые могли бы обеспечить независимый доступ на рынок ЕС для газа из Каспийского бассейна и/или Ближнего Востока. Газпром, кроме того, продолжает заключать двусторонние соглашения с импортирующими и транзитными странами, как внутри, так и вне ЕС. Такая стратегия является рациональной с точки зрения самой компании. С точки зрения ЕС, однако, остается вопрос: в какой степени это будет являться дополнительным препятствием к принятию (пока только зарождающейся) общей энергетической политики.

Помимо все более очевидного риска, связанного с недостаточными мощностями по поставке, транзиту и распределению энергии, другим фактором, способным оказать влияние на процесс реформ в СНГ, является динамика цен. Вслед за глобальными ценами на нефть, цены на природный газ в Европе выросли примерно в три раза начиная с 2002 года. Этот фактор ускорил корректировку цен во внутренней торговле газом среди стран СНГ, причем этот процесс еще не окончен и может, в окончательном итоге, привести цены на газ и электричество к экономически обоснованным уровням в экономике стран СНГ.

Первым шагом для предотвращения или смягчения будущего дефицита энергоресурсов должны стать меры по решению проблемы значительной энергетической неэффективности стран СНГ, с учетом того, что политика энергосбережения до сих пор не получила соответствующего уровня признания. Кроме того, высокий потенциал повышения безопасности и эффективности имеет рост внутренней торговли энергоресурсами внутри СНГ. Тем не менее, даже в данном случае не наблюдается серьезной политической воли для того чтобы воспользоваться такой возможностью, что, возможно вызвано политическими проблемами между некоторыми государствами СНГ и воспринимаемыми компромиссами в плане надежности поставок.

Мы рассматриваем корректировку внутренних цен на энергоносители под влиянием повышения цен на нефть и газ как возможность внедрения более существенных реформ энергетического сектора, в частности, повышения энергосбережения как со стороны предложения, так и спроса. В то же время, сложность таких реформ предполагает, что внешнее давление подобного рода, будучи потенциально полезным, может быть недостаточным для выбора оптимальной политики.

Мы видим здесь возможность тщательно спланированной поддержки со стороны международного сообщества и ЕС, в частности, технического содействия государствам СНГ в плане поддержки развития собственных вразумительных рыночных и стабильных стратегий и средств в области энергетики и охраны окружающей среды, что будет способствовать процессу реформирования. Основная институциональная реформа призвана окончательно оформить отделение правительственных функций по формированию энергетической политики от функций регулятивного управления и владения компаниями.

Проблемы энергетики должны по-прежнему оставаться важным элементом Европейской политики добрососедства (ЕПД), в то время, как финансовые ресурсы Инструмента европейского соседства и партнерства (ИЕСП) должны обеспечивать вполне амбициозные предприятия. Необходимо предусмотреть перспективы дальнейшего развития политики внутренних реформ в контексте Энергетического диалога «ЕС-Россия», а также «Бакинской инициативы», в которой участвуют также страны Средней Азии. Договор Энергетической хартии (ДЭХ) мог бы также использоваться более активно в рамках развития энергетического сектора, а также для решения проблем транзита. Для того чтобы ускорить прогресс в реализации политики регулятивных реформ, сочетая его с сильной приверженностью к дальнейшим реформам, некоторые европейские страны СНГ могут найти создание Энергетического сообщества привлекательным решением. Все это может также рассматриваться как шанс для нарождающейся внешней энергетической политики ЕС.

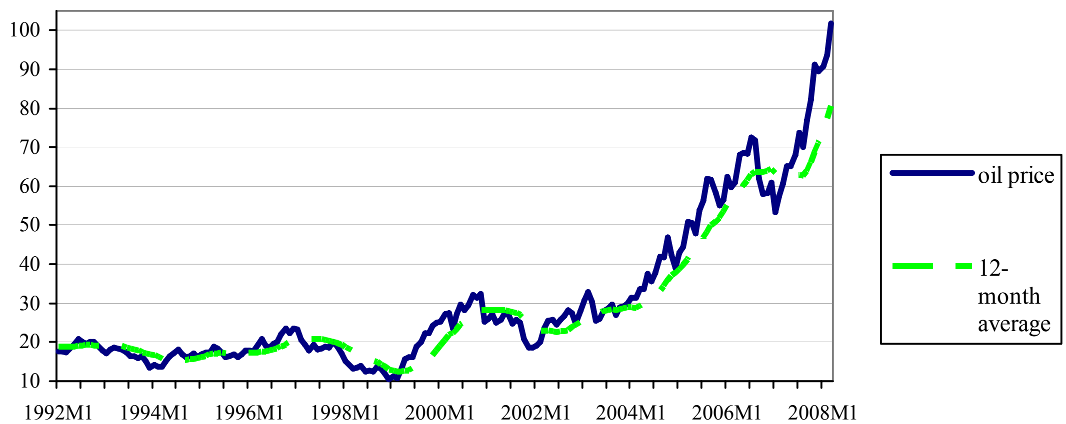
Что касается деятельности, получающей поддержку и финансирование ЕС, важно проводить четкое различие между решениями по поддержке, являющимися оптимальными для стран СНГ, и энергетическими интересами государств ЕС. Не менее важно различать здоровую конкурентную борьбу за проекты и действия, определяемые политическими факторами, которые могут затруднять перспективы развития в определенных странах СНГ. Европейскому Союзу следует принимать во внимание и учитывать определенные фундаментальные расхождения в интересах между странами СНГ, занимающимися добычей/экспортом/транзитом нефти, газа и электроэнергии и своими задачами обеспечить надежные и дешевые поставки. ЕС следует стараться не занимать однозначно экстремальных позиций по отношению к России: например, «мы не любим тебя, мы не доверяем тебе» или, напротив, «мы принимаем твои требования и закрываем глаза», поскольку ни один из этих подходов не может дать положительные результаты.

Мы надеемся, что ЕС получит выгоду от повышения эффективности и прозрачности операций в энергетическом секторе стран СНГ при соответствующих инвестициях в сферы поставок и транзита.

1. Introduction

Energy is a key sector with substantial implications for growth and macroeconomic stability in most countries of the Commonwealth of Independent States (CIS). In the last decade its development and increasing importance has been determined by the rapid rise of international oil prices. After reaching record-lows in 1998 (10-15 USD per barrel), prices increased to around 30 USD per barrel during 2001-2003 and then started a rapid surge surpassing 100 USD in early 2008 (Figure 1.1).

Figure 1.1 World oil prices, Jan 1992 – Mar 2008 (USD per barrel)



Note: The figure plots simple average of three crude oil spot prices: Dated Brent, West Texas Intermediate, and the Dubai Fateh.

Source: IMF commodity prices database.

As the natural gas pricing mechanism applied in the EU and in particular for EU imports from Russia links gas prices, with some lag, to oil prices, this has resulted in a similar surge of prices also for this commodity. The price of Russian gas at the German border almost tripled between 2002 and 2007 to above 300 USD per thousand cubic meters at end-2007, and over 350 in early 2008 (Figure 1.2)[1].

These price trends played an important role in driving several other macroeconomic developments. Major oil and gas exporters in the CIS have recorded a very high rate of economic growth in the 2000s, with booming energy export leading to large current account surpluses and a build-up of international reserves to exorbitant levels (above 500 billion USD at end-March 2008 in the case of Russia) and adding to inflationary pressure, especially in the most recent period.

The rapid increase in prices of natural gas sold to the EU markets has also triggered revision of gas prices in intra-CIS trade. Four points are worth mentioning here. Firstly, the CIS as a region and some CIS countries in particular (especially Ukraine) are very large gas consumers by

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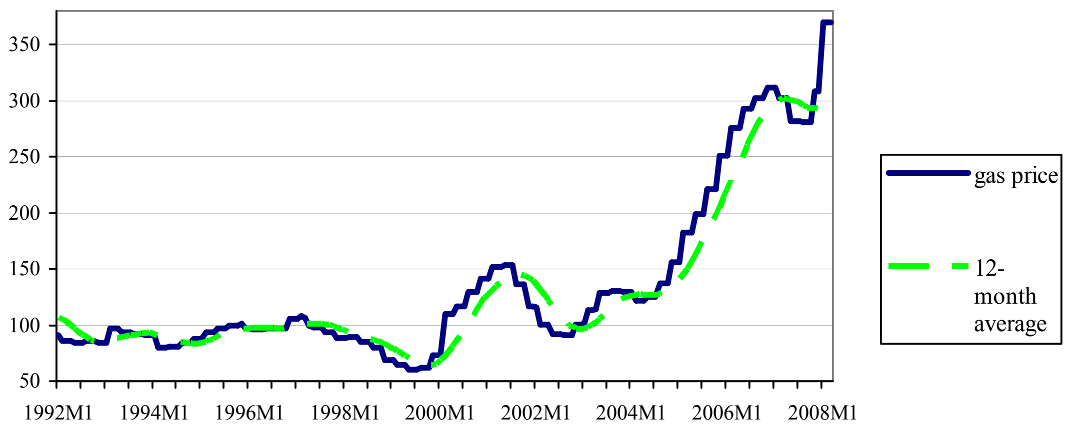
[1] For information on pricing mechanism applied to Russian gas in the EU see Energy Charter (2007). Stern (2007) argues that the rationale for linking gas prices to oil is weak, but several forces may imply that such a mechanism may stay in place for some time to come.

international comparison. Secondly, the import prices that prevailed until around 2005 were very low with Russia de facto subsidising some of its CIS partners, gas contracts were short-term (typically annual) while the conditions (prices) for gas supplies were closely linked to transit tariffs for Russian gas to the EU. Thirdly, the progress in reforms of the gas sector was very limited in most CIS countries. Fourthly, some CIS gas importing countries, and in particular Ukraine, play a key role in the transit of Russian gas to EU consumers. All these factors implied that an adjustment of prices of imported gas created much more problems in the CIS (leading also to political tensions) than in the EU economies.

Figure 1.2 Russian gas border prices in Germany, Jan 1992 – Mar 2008 (USD per tcm)



Source: IMF commodity prices database.

In Russia, by far the most important oil and gas producer in the CIS, recent years have witnessed a slow increase of domestic gas production. Oil production growth, after strong gains in the late 1990s and early 2000s have weakened more recently with several observers linking this to a substantial change in market structure. Following the forced bankruptcy of Yukos, the role of state-owned companies (notably Rosneft and Gazprom) has significantly increased. The bigger role of state in the oil and gas sector has been evident in Russia, but also in Kazakhstan and several other oil and gas exporting countries[2].

The period of rapid oil price increases has coincided with fast growth in oil production volumes in Kazakhstan and Azerbaijan, making macroeconomic challenges associated with the commodity boom even more dramatic. The differentiated policy responses of these countries provide interesting material for analysis.

Finally, in the EU a rising energy bill (roughly 4.5-fold increase in nominal euro terms between 1998 and 2006), declining domestic production of oil and gas and the EU accession of East European countries with high gas import dependency has determined at least part of the agenda of debate on a future energy policy in Europe (with the impact on environment and climate changes being other hot topics).

[2] For an interesting account of this trend see e.g. Baker Institute (2007) and other publications available at http://www.rice.edu/energy/publications/nocs.html

In this report the energy sector is understood as covering oil and gas upstream, midstream and downstream (i.e. production, transport and distribution), the electricity sector (including hydropower and nuclear) and, in some instances, coal. The treatment of the energy sector in subsequent sections of the report is specific to the context, and should be intuitive and self-explanatory. Production, export and, to a lesser extent, transit of oil and gas are the most important issues for the macroeconomic topics analysed in this report. The focus of relevant sections is on those CIS countries that are the major oil and gas producers, with the special role played by Russia. It is important to keep in mind the differences in the key characteristics of sub-sectors of such a broadly defined energy sector. Oil prices are market-determined and oil can be obtained at the spot price on the open market. This means that for importing countries (including the EU) problems arise from high prices rather than supply security. In contrast, the gas market is segmented, prices have been subject to long-term agreements (there is no 'world price'), which seemed to provide some security in European countries until prices started to come under pressure in 2005. Given limited LNG development the source of supply is largely dictated by pipeline networks, so that price disputes can lead to disruption of supply that is not easily replaced from other sources. Finally, there is little trade in electricity between CIS and EU countries. This makes electricity (and hydropower, solid fuels and nuclear energy) largely a separate topic, as are inefficiency in energy consumption and high energy intensity in the CIS. While these topics are important for various reasons and interrelated with oil and gas sectors the developments there have only indirect impact on international trade in energy products.

The report structure is as follows. The next chapter presents a review of selected literature on the subject. Chapter 3 assesses the macroeconomic importance of the energy sector in CIS countries. Subsequent sections of Chapter 4 deal with various macroeconomic issues related to the specific mode of functioning of the energy sectors in CIS countries. The first section tries to answer the question of whether large energy resources can be considered a positive or negative factor for long-term development prospects. The next section looks at one particular mechanism which was often considered a potentially important detrimental factor for economic development, the so-called Dutch Disease. Subsequently, in Section 4.3 fiscal policy challenges related to the modes of functioning of energy sectors in CIS are discussed: the role of energy in fiscal balances, analysing non-energy fiscal balances and institutions created to better manage the oil- and gas-related windfall revenues in the energy-rich CIS economies. The fourth section looks at energy sector related quasi-fiscal operations and phenomena, such as artificially low energy tariffs, non-payments, etc. Section five analyses the challenges for monetary policy in oil- and gas-rich economies of CIS and possible responses to these challenges. Finally, the last section of this chapter looks at redistribution of energy revenues in selected Central Asian oil and gas producing countries. Chapter 5 takes a different perspective trying to assess, from the EU side, the current and potential importance of CIS region as a source of energy supply. Chapter 6 presents key policy challenges facing the CIS energy sectors with a view to draw conclusions and recommendations.

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2. Literature survey

The literature on topics related to this report is large and has been growing rapidly for the last few years. This chapter aims at providing a selective critical review of the most important works analysing the issues that are of interest in this report.

The thematic area covered by this report is very wide, and the presentation of literature broadly follows the structure of the report, starting from analyses of the economic importance of energy sectors in the CIS region (and the CIS region in the global energy markets), before discussing selected macroeconomic issues related to the functioning of energy sectors in CIS countries. Subsequent sections look at the current and potential future role of the CIS region in EU energy supply and CIS energy policies.

The literature on macroeconomic aspects related to the functioning of energy sectors in CIS is discussed in more detail in respective sections of chapter 4, as this provides a natural introduction and background for our own analysis in these sections. Therefore, to avoid repetition, below we cover this literature only very briefly, focusing on the items not discussed later in the report. In contrast, we devote more space to review studies looking at CIS-EU energy co-operation and CIS energy policies.

2.1 The macroeconomic role and importance of the energy sector

The complicated character of operations, various price distortions and other factors, as well as limited access and subpar quality of official statistics, create a situation where a question on the actual macroeconomic importance of the energy sector in CIS countries is not a trivial one. Indeed, there have been several attempts to quantify various aspects of this.

The World Bank (2005) discusses the problems of proper identification of the share of oil and gas industry in Russian value added related to the practice of transfer pricing where production subsidiaries of companies transfer their profits to their trading subsidiaries in order to minimise tax payments. This issue (in the Russian context) is also tackled by Kuboniwa et al. (2005). IMF country reports for other major oil and gas producers try to provide estimates of the share of the energy sector in total value added.

The role of the oil and gas sector for fiscal revenues, the oil price elasticities of these revenues and other issues are also important topics discussed e.g. by Gianelli (2006), Rautava (2003), Merlevede et al. (2007), Kumah and Matovu (2007), OECD (2006) and Usui (2007). Lysenko and Vinhas de Souza (2007) provide a detailed account of the implications of gas import price increases in several CIS countries, devising indices of energy import dependence and gas import vulnerability for a range of CIS energy importers, analysing the macroeconomic effects of the energy-price shock on growth, macroeconomic stability, the budget and balance of payments.

Billmeier et al. (2004) discuss the expected revenues to Georgia after the country becomes a more important transit corridor for oil and gas.

From another perspective, several studies look at the international role of CIS energy resources. Regular publications by the International Energy Agency (e.g. IEA, 2007a) discuss CIS production and consumption trends and outlook separately given their importance for global oil and gas markets. A more detailed account can be found in IEA (2004). Ahrend and Tompson (2006) note that Russia alone accounted for almost half of global oil production growth during 1998-2004, with other CIS countries adding another 12%, in contrast to the combined OPEC contribution of just 26%. Grigoriev (2007) illustrates the relative roles of production and export growth of various CIS countries in the overall production and export dynamics of the CIS region. The author shows that between 2000 and 2006 the increase in Russian gas production outpaced the growth of all other CIS countries put together. However, in terms of export potential, the role of Turkmenistan was at least as important as that of Russia.

The role of Russia in global oil markets is also indirectly confirmed by the empirical importance of Mediterranean Russian Urals crude in global price setting for medium density and sour crudes. The analysis of Hagstromer and Wlazlowski (2007) (based on Granger-causality tests) finds it the third most important price setter, after WTI and Brent.

2.2 Macroeconomic challenges related to energy sector functioning

This section provides a highly condensed review of the literature in order to avoid repetition with the studies referred to in chapter 4 of the report.

2.2.1 Oil and gas and the CIS's development prospects

Auty (2004) provides an overview of the different positions and case studies related to resource abundance and economic development. The author discusses growth collapses, competitive industrialisation and staple strap models, and the policy implications for developing market as well as the transition economies. The author argues that the underperformance of resource-abundant countries is not inevitable and is determined by policies.

Ahrend (2006) maintains that Russia will remain heavily reliant on the energy sector for an extended period, even assuming the relative success of diversification policies. He notes some positive developments in policies aiming at simple and transparent rules, e.g. changes in fiscal federal relations and measures to curb bureaucratic interference in commercial activity. He also stresses the importance of the development of the financial sector.

Beck et al. (2007) looking at Russia's long-term growth prospects highlight the strong industrial base (and thus the moderate role of the energy sector) and relatively high level of human capital as factors supporting the development outlook. On the negative side, worrying demographic and public health trends suggest the need for policy action to improve the situation in this sphere.

Pomfret (2006) and Najman et al. (2005) discuss the results of an interesting investigation looking at micro level (household survey) data to identify where oil money flows inside Kazakhstan. This analysis is based on comparison of 1996 and 2002 data and thus captures the early years of the Kazakhstani oil boom. The results suggest that the benefits have not been redistributed evenly across the country, and in these early years were mostly felt by the metropolitan centres (the old and new capitals of the country), while oil-producing regions did not witness improvement in living standards, and rising inequality. These early results could be seen as warning signals for the institutional and political developments in the country. However, it is clearly too early to jump to any strong conclusions regarding future trends. Pomfret (2006) concludes that “the jury still has a long wait before determining whether oil will be a blessing or a curse” in Kazakhstan.

Despite the wealth of literature on Dutch Disease as a potential channel explaining such a resource curse (see e.g. Sachs and Warner, 1995), relatively few studies examine the case of transition economies. Those that do so focus on specific aspects of Dutch Disease. For instance, Kronenberg (2004) takes a good look at long-term growth, while Oomes and Kalcheva (2007) and Égert and Leonard (2007) study the impact developments in oil prices on the exchange rates of Russia and Kazakhstan, respectively. Kutan and Wyzan (2005) identify oil price effects on the real exchange rate in Kazakhstan and interpret their findings as potential symptoms of Dutch Disease.

2.2.2 Fiscal and monetary policy challenges

Gianelli (2006) studies the potential role of monetary and fiscal policies in ensuring a smooth adjustment to terms of trade shock stemming from higher oil prices. The paper concludes that fiscal policy should be the principal tool for macroeconomic management in Russia. It then elaborates on the potential role of fiscal rules in insulating the economy and budget from commodity-price fluctuations and on management of windfall oil and gas related revenues accumulated in the Stabilisation Fund. Merlevede et al. (2007) conclude from their modelling exercise that fiscal policy pursued by the Russian authorities over the last few years has tempered the economic fluctuations caused by oil price shocks.

Kwon and Spilimbergo (2005) offer an interesting analysis using regional fiscal data from Russia to analyse the pro- and counter-cyclicality of policies at this level. They conclude that regional governments use pro-cyclical fiscal policy and, in particular, that oil-rich regions did not change their overall fiscal balances significantly during the analysed period despite volatility in oil prices. Especially before 2000, oil-rich regions tended to use oil revenues to finance local expenditure, with negligible net effects of oil prices on their overall budget balances.

OSI (2003) provides a set of forward looking policy recommendations formulated at the time the oil boom was unfolding in the Caspian region (mainly Kazakhstan and Azerbaijan). Usui (2007) analyses the fiscal policy responses to the oil boom in Azerbaijan and Kazakhstan and discusses the functioning of the oil funds in these countries. The IMF (2007) presents a broader view on the role of fiscal institutions in managing oil revenue booms, with examples from CIS countries.

Akram (2005) derives a consumption rule that would reduce macroeconomic costs associated with spending revenues from natural resources and applies the framework to the Norwegian case.

Oil booms are often associated with major challenges to monetary policy. These may be exacerbated by the deficiencies of fiscal responses, which have been a typical feature of past oil booms in several countries. Adam and Goderis (2008) discuss in the Nigerian context one key challenge facing the central bank, namely the choice of strategy for exchange rate intervention and bond sterilisation in the face of volatile oil revenues. In their model, they conclude that an intermediate exchange rate regime, a crawl aimed at keeping the rate of nominal exchange rate depreciation close to the long-term inflation target turns out to be effective at reducing short-term real and nominal volatility. The result, however, is not very robust to changes in assumptions. The authors also stress the importance of fiscal stance as the conduct of fiscal policy has a major impact on availability of options available to the monetary authorities and preferences among them.

Bergo (2001) discusses the monetary policy strategy of Norway, taking into account the role of the oil and gas sector in the economy with ensuing volatility of terms of trade.

2.3 CIS – EU energy relations

Security of energy resources supply from CIS

There is a vast literature on the role of political factors and security of energy supplies (primarily gas supplies) from the CIS (mainly Russia) to the EU. Weisser (2007) (see also references therein) claims that Russia's energy policy is driven by geopolitical, foreign policy and security considerations at least to the same extent as by purely economic interests (see also Engerer, 2003). Stern (2006) observes that a deterioration in political relations between the EU and Russia may become a significant issue limiting the prospects of any more substantial increase in gas imports from the country. He analyses the politically driven EU response to the Russia-Ukraine gas crises of January 2006, when strong official condemnation of Russian policies contrasted with hardly any official pressure on the Ukrainian side, which probably shares responsibility for the incident.

Helm (2007) argues that gas import dependency is a serious issue for the EU and that its past policy of concentration on an internal agenda did not properly address this key challenge. Even at the internal level, gas liberalisation was promoted without proper network infrastructure and market structure. Externally, as Helm argues, the EU failed to respond to the successful policies of Gazprom, which has nationalised reserves, monopolised pipelines, built special bilateral relations, notably with Germany, and undermined the chances for the development of alternative pipeline infrastructure to bring Caspian gas to the EU. Helm then formulates recommendations for an EU response to the current situation, including conducting an effective EU-level external energy policy.

Jakubiak and Paczynski (2007) discuss the differences in security issues in respect to oil and gas markets. In the case of oil markets, the only important link between the CIS and EU markets is via the total export capacity of CIS oil producers (which matter for global oil prices), whereas the directions of CIS oil exports are of only secondary importance. This is in sharp contrast with the European gas market, where reliance on pipelines, limited storage capacity and very limited alternative supply options make the bargaining position of importing countries weaker.

The outlook for the CIS's production and export potential – the European perspective

Global trends and forecasts for energy commodities production, consumption and trade are regularly analysed by several agencies. Notably, the International Energy Agency (IEA) regularly publishes reports on various aspects of the global energy market, also with a focus on the CIS and its potential for Europe. In particular, a 2004 edition of the IEA's flagship publication – The World Energy Outlook – contained an in-depth analysis of Russia (IEA, 2004). The US government's Energy Information Administration also produces annual energy outlooks, which contain energy production and consumption forecasts by region and cover the CIS (the most recent International Energy Outlook is EIA, 2007).

There are also several studies that base their analyses on the existing information and forecasts sometimes enriched with own modelling exercises to answer particular questions relevant to EU energy security and the CIS's current and potential future role in this. Costantini et al. (2007) compare various energy scenarios from the European perspective and discuss the risks related to potential collusion among energy exporting countries in an environment of increasing EU reliance on energy imports from a limited pool of sources. CASE Transcaucasus (2008) analyse the prospects for oil and gas demand growth in Europe on the one side and production growth in the CIS region on the other to assess the potential for co-operation. The study highlights the importance of investments in the CIS energy sector for development of its production capabilities over the medium- and long-term and interdependence between long-term trends in CIS supply potential and EU demand for natural gas. The IEF (2007) foresee somewhat faster energy demand growth in Europe than the IEA (2007a) until 2030 (0.7% annually in the IEF scenario in contrast to 0.5% forecast by the IEA), and is more upbeat on the energy demand outlook for Russia, where the IEF expects an average annual growth rate of 2.3%, almost double the 1.2% figure envisaged by the IEA.

One of the key controversies regarding the outlook for the CIS and particularly for Russia concerns the future trends of oil and in particular of gas production. The views presented in the literature differ quite substantially, which should not be surprising given the generally accepted uncertainty in respect to the production outlook in this region, as discussed e.g. by the IEA (2004, 2007a). Some authors have advocated a pessimistic view, where lack of investment in the sector in recent years would lead to stagnation or decline in gas production and the inability of Russia to serve its long-term foreign contracts, while at the same time assuring some minimal level of supply to the domestic market (examples include Milov et al. 2006; Riley, 2006). Stern (2005) points to the fact that delayed investment in new fields (which is assessed as largely rational given developments in domestic gas prices) will indeed limit Gazprom's own production potential to around 2015. However, a combination of three solutions could provide enough gas to expand its gas sales and fulfil all existing export obligations: a focus on the development of smaller gas fields, supplies from Russian independent gas producers and supplies from Central Asian countries. Given the materialisation of some of these scenarios (notably an apparent success in securing supplies from Turkmenistan and Uzbekistan), Locatelli (2008) presents a more optimistic outlook where the output of Gazprom and other Russian firms is likely to increase at a pace that would be in-line with possible demand trends, which – under some scenarios – may imply faster growth than envisaged by previous Gazprom's estimates.

Goldthau (2008) considers lack of investment in the Russian upstream sector as a more important factor potentially affecting EU energy security than geopolitics, but nevertheless presents a rather optimistic outlook, in which higher domestic Russian gas prices, enhanced energy efficiency and increases in non-Gazprom production should allow for a sufficient expansion of Russian gas production. Kjärstad and Johnsson (2007) point to a likely short-term oversupply in the European gas market (as well as the US market) around 2010 and a possible decline in the Russian share of EU total imports as new producing countries increase their supplies to southern Europe, where demand is growing the fastest. The longer term prospects will hinge on investment decisions in the gas producing countries (including Russia), which in turn should be expected to be driven mainly by domestic interests rather than global / regional considerations. Spanjer (2007) also highlights the importance of combining analysis of Russia's external energy relations and its supply capacities with internal development in the country, focusing on gas pricing. Sagen and Tsygankova (2008) also highlight the importance of domestic gas prices in Russia for Gazprom's incentives to increase output and export capacity. Their main findings suggest that an increase in domestic gas prices appears vital to maintain Gazprom's market share in Europe over the next decade, but a too strong increase – bringing Russian prices to European net-back levels – could result in reduced exports and a stronger focus on domestic sales.

In view of the uncertainties several studies have chosen to avoid taking any strong position on Russia's gas export potential and instead treat Russia as a swing supplier, presenting a difference between expected demand growth and projected supplies from other sources as a ‘call on Russian gas’ (see e.g. Tönjes and de Jong, 2007).

Turning the focus to the Caspian region, Ahrend and Tompson (2007) conclude that one cannot assume that the Caspian region's oil and gas potential will be developed in a timely and economically efficient way. The outlook is partly due to objective geological and geographical characteristics, and partly it depends on international oil and gas price developments. However, there is plenty of room for domestic policy action that could affect the long-term elasticity of supply. The authors’ assess the current policy trends in the region as rather discouraging from this perspective.

Stern (2006, 2007) argues that current conventional wisdom on European gas security issues may be oversimplified in many respects. Among the key points relevant for security of supply in the short- to medium-term (up to around 2015) are facility failures, notably including problems of EU gas infrastructure. Indeed, Stern notes that the very often referred to Russia-Ukraine gas incident in January 2006 cannot be classified as the most important gas security incident in that year. These were rather problems related to a fire at the UK’s Rough storage reservoir in February 2006 and uncertainties in Italy caused by an unusually cold winter. The reaction of EU policy makers to the Russia-Ukraine gas crisis could be interpreted as indicating that the EU might not be willing to increase its gas imports from Russia beyond volumes that would fill the new Baltic Sea pipeline – Nord Stream – as higher reliance on Russia would be perceived (perhaps wrongly so – but this is not that important) as limiting energy security.

Beyond 2015 availability of additional gas supplies to Europe may become questionable given the expected increase in Russian domestic gas prices, making exports to the EU a less favourable option for the Russian side, a possible continuation of difficult political relations between the EU and the major potential producing regions, and the increasing popularity of LNG technology, with the on-going globalisation of gas markets (where European consumers will have to compete with US consumers). Stern also raises doubts as to whether one can expect any more significant and secure pipeline supplies flowing to the EU from the Caspian Sea region and Middle East.

Transit infrastructure for CIS oil and gas deliveries to the EU

Apart from production capacity and domestic consumption, the export potential of the CIS region to the EU will also depend on the existing transportation infrastructure. It is therefore not surprising that this topic has been analysed in several studies.

Energy Charter (2007e) provides a detailed description of the gas transit infrastructure in the CIS region as well as the legal and regulatory framework applying to their usage. Given the dynamic changes in some of the analysed countries, in some instances the information may already be outdated. A similar account of the oil transit infrastructure is provided by Energy Charter (2007f).

Tönjes and de Jong (2007) discuss some of the issues concerning the planned Russian gas pipelines – Nord Stream and South Stream. Von Hirschhausen et al. (2005) demonstrate by means of simple game theory simulations the interplay between diversification of gas export routes and the bargaining power of transit countries vis-à-vis Russia. In particular, the opening of the Yamal pipeline through Belarus is shown as limiting the market power for Ukraine. Lother and Bothe (2007) highlight the importance of analysing the impact of newly established transportation corridors on the whole gas infrastructure in Europe. They build a model allowing for such an impact analysis and use it to investigate the impact of the Nord Stream project (a planned pipeline through the Baltic Sea linking Russia with Germany, bypassing any intermediaries).

Transportation infrastructure is of particular importance to the Caspian Sea region. The opening of new oil pipelines (CPC, Kazakhstan-China and BTC) has allowed for a robust increase in their oil production and exports. In the case of natural gas, the only route to European markets is currently via Russia. Jakubiak and Paczynski (2007) highlight the monopsony power of Russia in pricing gas from Central Asia. Energy Charter (2007b) discusses price trends at various places along the existing gas pipeline infrastructure. Bilgin (2007) recommends that from the perspective of diversification of EU energy supplies, in the near- to medium-term the EU should focus on transit infrastructure from Azerbaijan, Kazakhstan and Turkmenistan before focusing on the potential of Iranian, Iraqi and Egyptian hydrocarbons.

Egenhofer et al. (2006) point to the somewhat peculiar situation in which Russia, the largest external supplier of oil and gas to the EU, is additionally absorbing oil and gas produced in the Eastern Caspian basin, providing recommendations on EU support for independent corridors for transporting Caspian Sea oil and gas.

2.4 Energy policies in the CIS

Different aspects of CIS energy policies and various reform challenges facing the sector have attracted a substantial amount of analysis and advisory work.

The policies of energy-rich CIS countries towards foreign investors in the energy sectors have recently become studied more extensively, following a general shift to a more assertive policy. Krysiek (2007) documents the change in the case of Russian Production Sharing Agreements (PSA). In the introduction he contrasts the statement of the former CEO of the Sakhalin-2 consortium, who in the early 1990s claimed that their deal with the Russian government included some of the best PSA terms that were possible in Russia, with a situation twelve years later when Russian President Vladimir Putin forced the remaining partners of the consortium to sell a controlling stake to Gazprom. Krysiek (2007) concludes that case studies of the three PSAs from the Yeltsin era reveal the official and unofficial position of the Putin administration towards this type of agreements and more generally the role of foreign investors in the oil and gas sector. The author concludes that foreign companies are unlikely to be allowed to play any role beyond junior partners in joint projects with Gazprom or Rosneft, the actively supported state champions. Detailed accounts of the role of state-owned leaders in oil and gas sectors in Russia and Kazakhstan can be found in Poussenkova (2007) discussing Rosneft and Olcott (2007) describing KazMunaiGaz, while Baker Institute (2007) puts this into a global perspective.

Reynolds and Kolodziej (2007) analyse the institutional aspects of the Russian upstream oil industry as it first changed from central planning to a market-oriented sector and then more recently swayed toward re-nationalisation and the potential consequences of this for oil supply. Ahrend and Tompson (2006) also look at the likely (negative) consequences of the shift towards a greater state role in the energy sectors in Russia and Kazakhstan on the production outlook. Rossiaud (2007) presents the opposing view, suggesting that ownership changes in the Russian oil sector can be viewed as a coherent oil policy addressing the failures of sector structure stemming from the privatisation process.

Electricity sector reforms are one of the key challenge in the CIS region, where the benefits of relatively well developed networks (a legacy of the Soviet electrification campaigns) is limited by obsolete pricing and the regulatory framework and insufficient co-operation between CIS countries leading, inter alia, to lack of investment and deteriorating reliability of supply in some regions. A review can be found in World Bank (2006).

Energy Charter (2006d) provides a detailed description of the key energy trends and challenges in the region. It notes that the Central Asian countries have a surplus electricity available for export over the next 20 years or so, and that their energy grids are relatively well interconnected (although some countries face a problem of limited domestic connection and poor links to other regions, notably with South Asia). The study further notes that the electricity trade between the Central Asian countries can be better described in relation to the formal obligations of the 1998 Agreement (where Kyrgyzstan and Tajikistan agreed to operate their hydropower plants in an 'irrigation mode', i.e. saving water during winter and releasing it in summer to help irrigation in the lower riparian countries – Kazakhstan and Uzbekistan, which in turn agreed to provide supply of electricity during the winter season) rather than pure electricity trade based on economic incentives. Therefore it is not that surprising that the scheme came under increased pressure in an environment of rising oil and gas prices, when Kazakhstan and Uzbekistan became more interested in exporting their hydrocarbons than in generating additional power to meet the winter peak demand of the other two countries.

Mehta et al. (2007) look at the diverse experience of attempts to reform power sectors in Central Asian countries. They conclude that the transparency of operations of Central Asia's power utilities needs to be increased and that incentives for distribution companies to perform their billing and cash collection responsibilities needs strengthening. They also highlight the importance of setting limited and consistent objectives for sector regulators, and the independence of the transmission company in promoting economically and environmentally efficient and sustainable regional power trade.

Electricity sector policies in Russia and the ambitious reform programme adopted by the Russian government have been the subject of many analytical and advisory studies. The World Bank (2007) provides an interesting insight into the struggle over power sector policies from the perspective of the externally financed project supporting electricity sector reform. Earlier documents (World Bank, 2004a; World Bank, 2004b) set the scene at the time just before the key decisions on the reform.

The IEA (2006) reviews the key challenges facing restructuring efforts. Pogrebnyak (2007) provides a recent review of reform progress, highlighting key issues, including the impact of controlled electricity tariffs on investment, growing market power that could (via its impact on prices) deter entry in electricity generation, the attraction of domestic and foreign investors and vertical integration where gas and oil suppliers enter the power generation sector due to its more progressed liberalisation (as compared to the gas market) and possibility to balance fuel supply between domestic and foreign sales.

The situation in the Russian gas sector has also been discussed in several studies. The World Bank (2004) identifies the key challenges and presents recommendations for reforms. Ahrend and Tompson (2005) describe the gas industry as probably the least reformed major sector in Russia and claim that the then prevailing market structure and regulatory framework was unlikely to allow for any significant output growth. They recommend an increase in transparency in the sector and specifically a transfer of some of the regulatory functions performed by Gazprom to state bodies and, secondly, substantial unbundling of Gazprom in particular involving the removing Gazprom control on pipeline infrastructure and abolishing Gazprom's monopoly on gas exports outside the CIS region. The IEA (2006a) provides a detailed analysis of the functioning of gas sector in Russia with several policy recommendations.

Eikeland (2007) provides a rationale for a strategy to be pursued by oil and gas producers of downstream acquisitions in a liberalised market. Locatelli (2008) points out that this mechanism can play a role in Gazprom's current strategy in EU markets, which could be seen as a response to the attempts to liberalise the EU gas markets.

Several studies focus on narrow, well-defined questions such as gas pricing in Russia. Not surprisingly, the conclusions vary according to source. Sticking to the gas pricing issue, Spanjer (2007) concludes that from the European perspective the perceived advantages of unified Russian gas pricing appear overstated and the security of supply to the EU could actually worsen once there is no difference in prices paid for gas by EU and CIS (including Russian) consumers (although the argument does not sound particularly persuasive). Tsygankova (2007) provides results of an interesting modelling exercise trying to capture the key characteristics of the Russian gas market. It shows that from the Russian perspective, under current domestic market structure (with the dominant position of Gazprom), abolishing Gazprom's export monopoly for natural gas could be welfare reducing. It also provides explanations as to why the current policies may be actually strengthening the monopolist position of Gazprom in the domestic market (by buying the assets of independent producers). The long-term consequences of this self-enforcing mechanism are not analysed in the study. The modelling exercise carried out by Tarr and Thompson (2004) suggests that from Russia's perspective there is no economic rationale to unify the price of natural gas sold domestically and abroad.

The IEA (2006b) covers the broad range of energy policy issues in Ukraine. Pirani (2007) provides an in-depth description of the Ukrainian gas sector, which is a very important player in the European market – serving as a transit corridor for roughly four-fifths of Russian gas exports to Europe, and is the most important gas producer and a very large gas consumer.

An account of the investment climate in the energy sector – an area that is often subject to controversies and uncertainties – can be found in recent publications on Belarus (Energy Charter, 2007c), Kyrgyzstan (Energy Charter, 2007d), Ukraine (Energy Charter, 2006a), Azerbaijan (Energy Charter, 2005a) and Uzbekistan (Energy Charter, 2005b). These five publications have been mainly prepared by the governments of the respective countries.

Improving energy efficiency is arguably one of the key challenges for several CIS economies, both energy producers and countries relying on imported resources. Energy Charter (2007a, 2006b, 2006c, 2005c) provide an in-depth analysis of the progress in energy efficiency policies in Russia, Kazakhstan, Georgia and Armenia, respectively, as reported by the governments of these countries.

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3. Energy sector and its macroeconomic importance in CIS

3.1 Introduction

In several CIS countries (net exporters of energy resources) the energy sector contributes a substantial part of GDP and takes up a large share of exports and fiscal revenues. Net energy importers tend to be interested in stable energy supply, which is a crucial condition of their industrial development and of domestic energy production (electricity, heat, oil products). The CIS energy sector attracts a substantial part of incoming FDI, part of which takes the form of debt-to-equity swaps deals with Russia.

Most CIS countries are large energy consumers due to their continuing high energy intensity. Meanwhile, growing costs of energy imports, combined with quasi-fiscal activities and lack of reforms, have became a burden for fiscal policy and a serious threat to sustainable development. Simultaneously, the poor functioning of the energy sector and the necessity to pay higher prices for imported energy have encouraged structural reforms in some CIS countries.

This chapter analyses the importance of the energy sector for CIS economies. Its structure is as follows. The second section looks at the general characteristics of CIS countries in respect to their energy sectors. In the third section, we analyse energy production, consumption and energy reserves in some CIS countries. The fourth section provides information on the macroeconomic importance of the energy sector for CIS countries (in terms of its share in GDP, budget revenues, trade dynamics and structure, etc.). The fifth section analyses such specific issues as pricing policy for imports, external indebtedness, (un)reliability of electricity provision, energy intensity of CIS economies, etc. The sixth section provides the chapter's conclusions.

3.2 The energy sector in CIS countries: differences and similarities

The energy sector plays a very important role in all CIS countries; however, its concrete impact on macroeconomic performance and development perspectives differs depending on the characteristics of particular countries.

Azerbaijan, Kazakhstan, Russia, Uzbekistan and Turkmenistan[3] are large energy producers, exporters (and consumers). Azerbaijan, Kazakhstan and Russia have large reserves of both oil and gas, while Uzbekistan and Turkmenistan have mostly large gas reserves. Besides, Russia and Kazakhstan possess substantial uranium reserves. More information on production and the reserve capacities of these countries is provided in the next section.

The share of the energy sector in GDP of these countries is up to 40%, while its share in industrial output is even higher. Energy exports exceed 60% of total exports. Energy-related revenue is a key item of budget revenues.

[3] In this analysis we try to include Turkmenistan to the extent that data availability allows.

Belarus, Ukraine, Armenia, Moldova, Georgia, Kyrgyzstan and Tajikistan are net energy importers, although the relative scale varies. For example, Belarus and Ukraine are large energy consumers, importing from Russia most of their energy resources (although Ukraine is also a large producer of natural gas, with gas output only minimally below Kazakh gas production and well above production in Azerbaijan).

Other countries have more an agricultural than an industrial profile. Besides, some (such as Tajikistan and Kyrgyzstan) possess substantial hydro resources, which can be considered an inexpensive input for the electricity generation industry (although only up to 10% of the hydro potential is used due to a lack of investment in aging and outdated equipment, as well as political disagreements on how to share water resources between irrigation and power generation[4]). These countries consume relatively small volumes of imported gas and oil.

For some countries, the energy sector has recently become an important instrument of 'transit power' and provided an opportunity for tough negotiations with energy exporters in order to keep internal energy prices at a relatively low level. As such, we can distinguish one more group – energy transit countries. This includes mainly Ukraine, Belarus, and Georgia. However, Azerbaijan, some Central Asian countries, and to some extent, Russia (with respect to Central Asian gas) can be also considered as transit countries. In some of these cases, transit fees contribute substantially to budget revenues, exports of services and attract FDI inflows.

Most energy importers and exporters continue to be characterised by low energy efficiency, partly due to the Soviet era legacy, partly due to policy of low (and cross-subsidised) domestic tariffs, which destroy market incentives to save energy (see the section on the quasi fiscal role of the energy sector in chapter 4 for more details). However, if energy intensity is measured using GDP converted at PPP exchange rates rather than market exchange rate, CIS energy intensity falls substantially, and some CIS countries (Armenia, Moldova) are actually close to the EU average (Lysenko and Vinhas de Souza, 2007). The record of the best performing CIS countries can be mainly explained by their low level of industrialisation (the main source of energy inefficiency in the CIS). There is, however, a general trend towards improving energy efficiency in the CIS region, especially in the case of energy importers, where recent increases in energy prices have provided stronger incentives for energy saving.

3.3 Key statistics on energy resources

CIS countries as a group are among the largest global energy producers, supplying around 15% of global oil exports and over 25% of gas exports (BP, 2007). Their combined reserves amounted to 10% of global proved oil reserves and 32% of gas reserves as of 2006. Russia accounts for a large majority of this, but in the future Kazakhstan also has the chance of entering the group of the largest global oil producers.

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4 The so-called 'water-energy' problem in Central Asia, with the Kyrgyz Republic interested in using water reserves for electricity production in winter and accumulate them in summer, while neighbouring downstream countries (Kazakhstan, Tajikistan and Uzbekistan) need water for irrigation in spring and summer. This leads to difficult relations in the water-energy sphere in this sub-region. See Kyrgyzstan background note for details.

3.3.1 Oil sector

Russia is currently the second largest exporter of oil (after Saudi Arabia). The role of other countries is increasing. For example, Kazakhstan holds 10th position on the world list of proven oil resources and, according to some forecasts, by 2015 will enter the top-10 group of oil exporters. It is expected that in 2015, its annual oil extraction will reach 130-140 Mt and exports will total no less than 110-120 Mt (EIA data[5]), i.e. just below one third of current Russian exports. Azerbaijan is currently undergoing an oil boom with very steep growth in production. However, the current boom may be short-lived, with expected upcoming stagnation and later a decline in output, unless new reserves are discovered. Uzbekistan and Turkmenistan are less important oil producers.

Table 3.1. Oil production, consumption and proven reserves

	1991	1996	2000	2006	2006, share of world total, %
Oil production, Mt annually					
Azerbaijan	12.5	9.1	14.1	32.5	0.8
Kazachstan	26.6	23.0	35.3	66.1	1.7
Russia		302.9	323.3	480.5	12.3
Uzbekistan	2.8	7.6	7.5	5.4	0.1
Turkmenistan		4.4	7.2	8.1	0.2
Domestic oil consumption, Mt annually					
Azerbaijan	8.5	5.9	6.3	4.7	0.1
Kazachstan	21.7	10.2	7.4	10.6	0.3
Russia	-	130.1	123.5	128.5	3.3
Uzbekistan	12.6	6.6	6.7	6.9	0.2
Turkmenistan	-	3.0	3.6	5.2	0.1
Proven reserves, billion tonnes					
Azerbaijan	-	-	-	1.0	0.6
Kazakhstan	-	-	-	5.5	3.3
Russia	-	-	-	10.9	6.6
Uzbekistan	-	-	-	0.1	< 0.05
Turkmenistan	-	-	-	0.1	< 0.05

Note: For the sake of comparability BP statistics are used. National statistics or IEA data vary somewhat in some instances. For more information see country backgrounds in Appendix 1.

Source: BP (2007).

3.3.2 Gas sector

Gas is another important energy source for the analysed group of countries. Russia holds the world's largest natural gas reserves, estimated at 47.65 tcm, or 26% of global reserves, nearly

[5] http://www.eia.doe.gov/emeu/cabs/Kazakhstan/kazaproj.html

twice the reserve level of the next country in this ranking (Iran). Gazprom is the largest Russian producer, but other (independent) gas producers and major Russian oil companies control about a third of Russian natural gas reserves and in 2006 non-Gazprom gas production reached 106 bcm, 16% of the total (and only slightly less than the combined production of other CIS countries)[6]. The slow growth of Russian (mainly Gazprom) output in recent years can be attributed to ageing fields, state regulation, Gazprom's monopolistic control over the industry and insufficient export pipelines (high transmission and distribution losses), as well as end-use inefficiencies. Three major fields (the 'Big Three') in Western Siberia – Urengoy, Yamburg, and Medvezh'ye - comprise more than 70% of Gazprom's total gas production, but these fields are now in decline. Although the company expects an increase in its natural gas output between 2008 and 2030, experts forecast that most of Russia's natural gas production growth will come from independent gas companies such as Novatek, Itera, and Northgaz[7] (Popov, 2006). The production outlook is discussed in more detail in Chapter 5.

Table 3.2 Gas production, consumption and proven reserves

	1991	1996	2000	2006	2006, share of total, %
Gas production, bcm					
Azerbaijan	9.2	5.9	5.3	6.3	0.2
Kazachstan	7.4	6.1	10.8	23.9	0.8
Russia	-	561.1	545.0	612.1	21.3
Turkmenistan	-	32.8	43.8	62.2	2.2
Ukraine	-	17.2	16.7	19.1	0.7
Uzbekistan	38.1	45.7	52.6	55.4	1.9
Domestic gas consumption, bcm					
Azerbaijan	15.8	5.9	5.4	9.6	0.3
Kazakhstan	13.2	9.0	9.7	20.2	0.7
Russia	-	379.9	377.2	432.1	15.1
Turkmenistan	-	10.0	12.6	18.9	0.7
Ukraine	-	82.5	73.1	66.4	2.3
Uzbekistan	36.8	43.3	47.1	43.2	1.5
Proven reserves, trillion cubic metres					
Azerbaijan	-	-	-	1.35	0.7
Kazakhstan	-	-	-	3.0	1.7
Russia	-	-	-	47.65	26.3
Turkmenistan	-	-	-	2.86	1.6
Ukraine	-	-	-	1.1	0.6
Uzbekistan	-	-	-	1.87	1.0

Note: For the sake of comparability BP statistics are used. National statistics or IEA data vary somewhat in some instances. For more information see Country backgrounds.

6 See http://gasforum.ru/novosti/613/

7 http://www.eia.doe.gov/emeu/cabs/Russia/NaturalGas.html

Source: BP (2007).

Turkmenistan holds up to 2.8 tcm of proven gas reserves spread over nearly 150 individual sites. In 2006, it produced about 54.6 bcm of natural gas and exported 42 bcm. Gas output in Turkmenistan has stagnated due to poor extraction and transport facilities, poor business environment, and close proximity of gas fields to the Iranian and Afghan borders.

Uzbekistan is the world's eighth largest natural gas producer. The volume of Uzbek proven natural gas reserves at the end of 2006 was estimated at 1870 bcm (BP, 2007). Very large domestic consumption limits export capacity. Nevertheless, exports (especially to Russia) have been increasing for the last few years and in 2006 totalled 12.65 bcm.

At the end of 2006, the amount of proven Kazakhstan's gas reserves totalled 3000 bcm (BP, 2007). The largest deposits are Kashagan, Tengiz, Karachaganak and Amangeldy. Kazakhstan only recently became a net exporter of gas, with forecasts of production growing to 40 bcm in 2010, and 70 bcm in 2015, mostly for export.

Azerbaijan only recently became a net exporter of natural gas. The volume of gas extraction is expected to grow in the next few years probably reaching 15-20 bcm by the middle of the next decade. The main proven gas reserves are concentrated in the Shah Deniz offshore deposit.

3.3.3 Electricity production

Most CIS countries generate electricity mainly by burning coal and gas. Belarus and Turkmenistan fully rely on these inputs, while Kazakhstan, Azerbaijan, Moldova and Uzbekistan produce 85–90% of their electricity from these sources. Hydropower provides more than 90% of electricity output in Tajikistan and Kyrgyzstan and slightly less in Georgia, also playing an important role in Armenia. In Russia and especially in Armenia and Ukraine nuclear power stations significantly contribute (close to 50% in Ukraine) to the electricity supply. Other sources of power generation, such as geothermal, solar and wind energy, wood and waste, play a marginal role. Their largest volumes are in Russia but they do not exceed 0.3% of the total electric power generated.

Table 3.3 Energy power generation, billion kWh

	1992	**1995**	**1998**	**2000**	**2002**	**2004**	**2005**
Armenia	8.62	5.04	5.82	5.62	5.22	5.90	5.98
Azerbaijan	18.58	16.10	17.02	17.65	18.47	20.48	20.10
Belarus	35.34	23.42	22.09	24.54	24.87	29.34	29.08
Georgia	11.14	6.65	7.90	7.27	7.16	6.81	7.14
Kazakhstan	78.56	63.18	46.60	48.91	55.28	62.31	64.23
Kyrgyzstan	11.73	12.16	11.42	14.71	11.75	14.94	15.15
Moldova	10.59	5.72	4.54	3.37	3.25	3.67	3.88
Russia	965.92	817.30	787.80	832.98	847.06	886.31	904.40
Tajikistan	16.61	14.61	14.27	14.09	15.13	16.32	16.89
Turkmenistan	12.39	9.21	8.85	9.26	10.06	10.78	12.05
Ukraine	238.58	183.37	163.17	160.13	163.87	172.72	175.38
Uzbekistan	48.17	44.91	43.43	44.32	46.67	48.30	45.15

Source: Energy Information Administration, USA.

The electricity mix has been broadly stable in the CIS (see Appendix 2). The most significant changes occurred in Armenia, after it restarted its only nuclear power station in 1996. A trend towards the growing importance of nuclear energy has also been observed in Ukraine (at the expense of conventional thermal electric power). In Georgia, the share of solid fuels and gas in the electricity mix dropped from 40% to 10% during 1992–2005. During the same period total electric power generation decreased by 36% (see Table 3.3). In fact, in comparison to 1992 electricity output decreased in all CIS countries, except Kyrgyzstan, Azerbaijan and Tajikistan.

Looking at individual countries, in Armenia a nuclear power plant provides 30-40% and hydroelectric plants 20-35% of the total electricity production. The remaining demand is satisfied by thermal power plants, that can burn either oil or natural gas.

88% of Azerbaijan electricity volume was generated at thermal and 12% at hydroelectric power stations. The construction of new power stations and the reconstruction and updating of the electricity infrastructure have been intensified in recent years.

Belarus, apart from being fully reliant on natural gas for 98% of its electricity generation, also imports substantial amounts of electricity (around 30% of the total consumption).

Currently, above 70% of Georgia's electricity is generated by hydropower plants. Thermal power plants and imports (mainly from Russia and Armenia) satisfy residual demand.

Moldova imports 75% of its electricity consumption.

In Kazakhstan, thermal power plants are based mostly on coal (close to 75% of total electricity generation) with gas and fuel oil playing a smaller role. The hydroelectric power plants account for 12% of power generation.

Russia's power sector includes over 440 thermal and hydropower plants (approximately 77 of which are coal-fired) plus 31 nuclear reactors. Thermal electricity generation (based on natural gas, coal, and oil) accounts for roughly 63% of total electricity production, followed by hydropower (21%) and nuclear energy (16%).

About 90% of Tajikistan's generating capacities is hydroelectric. A specific feature of the electricity sector is that aluminium production alone accounts for 40% of all the domestic electricity consumption (with the Tursunsade aluminium plant being closely integrated with its own hydropower station).

Electricity production in Ukraine comes from two major sources: nuclear power (around 50% in 2005), and thermal power plants (coal- and gas-fired – around 43%), with hydropower accounting to around 6%.

About 75% of power in Uzbekistan is currently generated in gas-fired plants.

3.4 Key statistics on the role of energy sectors in CIS economies

While there is no general definition of when countries can be considered energy-based economies, one indicative reference could be a 10% share of energy in GDP and 40% of exports. This threshold is easily met by Azerbaijan, Kazakhstan, Russia and Turkmenistan. More than half of Azerbaijan's GDP and roughly 90% of its exports are accounted for by the oil and gas sector. In Kazakhstan, the share of oil and gas in GDP is around 30%, while oil exports account for nearly 60% of all exports. Oil and gas exports account for about 60% of Russia's federal budget revenues and a similar share of exports. On the other hand, these countries do not fully fit the characteristics of 'petro-states' or 'energy states'[8]. For example, the Venezuelan and Nigerian economies depend on the fuel industry for 80-90% of their export earnings and 50-65% of budget revenues, amounting to 20-30% of GDP[9], which is still not the case with CIS countries, with the possible exception of Azerbaijan (although such a situation may be temporary). Quite clearly, the energy sector is of very high importance for the macroeconomic and social development of these five CIS countries.

3.4.1 The share of the energy sector in GDP

The share of the energy sector in the economy differs greatly from one CIS country to another. It depends mostly on whether the country exports oil and gas or not. It is highest in countries such as Azerbaijan, Kazakhstan, Turkmenistan and Russia but the exact share is difficult to estimate. According to the IMF, oil-related activity accounts for roughly 30% of GDP in Kazakhstan (IMF, 2005). The IMF and World Bank suggest that in 2005 the oil and gas sector represented around 20% of Russia's GDP, while other sources pointed to figures closer to 30%[10]. According to the Federal State Statistics Service (Rosstat), the oil and gas sector share was only about 10.5% in 2005.

The differing numbers can be explained by the different statistical methodologies applied. Official methodology neglects the problem of transfer pricing, which is widespread in Russia (World Bank, 2005). The issue is that, formally, most of the value added in the oil business is created not by extraction enterprises but by trading enterprises, usually affiliated with extraction enterprises into holdings (Kuboniwa et al., 2005, Elman et al., 2006). Trading companies receive huge rents as they acquire crude oil at low local prices and sell it abroad at world prices. In official statistics this rent is attributed to trade rather than to the oil sector, which distorts the real picture. The World Bank and other research have tried to redistribute this rent back into the energy sector on the basis of input-output tables[11]. Adjusting Russian oil-sector profit margins to Western norms brings the oil and gas sectors' share of Russia's GDP to the 20-25% range (Oppenheimer and Maslichenko, 2006).

In order to prevent a divergence of estimates in this study a simplified but unified methodology was applied for all CIS countries. In this section the share of the energy sector was estimated by means of the following procedure. Firstly, the share of the energy sector in industrial output was calculated based on national statistics. The energy sector was defined as the sum of mining fuel

[8] However, there is another, more politicised, definition of a petro-state, where oil and gas considerably influence a country's policy. In the XXI century, similar to some past experiences, oil and gas transformed themselves from simple commodities into 'political' commodities. In some countries gas and oil became instruments for foreign and domestic policies. Some analysts (see e.g. Goldman, 2008) have described some of the recent developments in Russia and some other CIS countries along such lines. On the other hand, some other CIS countries that serve as important transit corridors for oil and gas were also using their position to engage in political games.

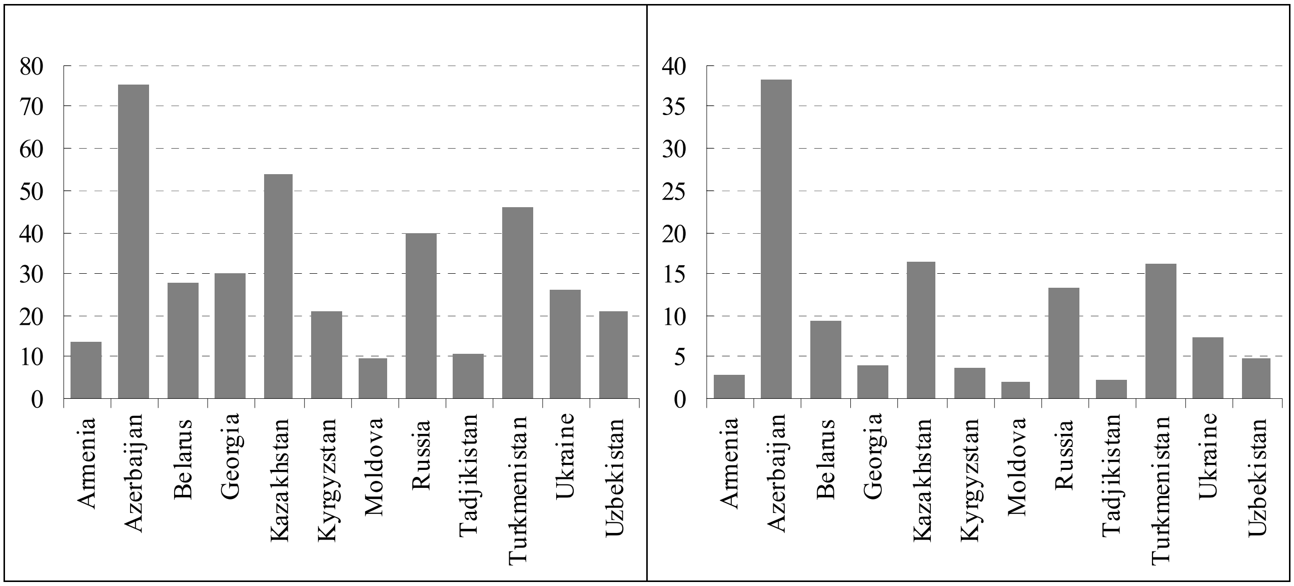
[9] See https://www.cia.gov/library/publications/the-world-factbook/geos/ve.html for Venezuela and https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html for Nigeria.

[10] http://unece.org/ie/se/pp/ee21_sc/17scMay06/2_1_Soloviov.pdf.

[11] However, taking into account the progressive reduction of transfer pricing practices in the energy sector in Russia (closely associated with increases in domestic energy prices) and the falling growth rate of this sector, one can conclude that the Rosstat estimates might be closer to the mark, in terms of the *direct* contribution of the energy sector to GDP.

and energy minerals, production of coke and refined petroleum products and production and distribution of electricity and gas. Secondly, this share was multiplied by the share of industrial output in GDP. The results of these estimations are presented in Figure 3.1.

Figure 3.1 Share of energy sector in industrial output (left panel) and in GDP (right panel), 2005 (%)



Source: Estimates based on CIS statistics committee, national statistics committees of CIS countries.

The highest contribution of energy to GDP and industrial output is in Azerbaijan. More than a third of Azerbaijan's GDP and three quarters of its industrial output is directly related to the energy sector. Such a level implies that the economy is vulnerable to external risk factors such as energy price fluctuations.

A similar situation, although not so dramatic, can be observed in Kazakhstan. The share of the fuel industry in Kazakhstani GDP grew from 3.4% in 1998 to 15.8% in 2002. The share of the fuel industry in industrial production more than tripled during this period, which is related not only to the increasing extraction of oil and gas but also to an output decline of manufacturing industries[12]. As a result, the energy sector produced more than half of industrial output in 2005 and its share in GDP was estimated at above 16%.

In Turkmenistan, the contribution of the energy sector to GDP and industrial production was very similar to levels estimated for Kazakhstan.

In Russia, the energy related sector accounted for 40% of industrial production in 2005. Taking into account Russia's size and initial diversification, this seems to be a high share. Our estimation implies a share in GDP of below 15%.

The energy sector in other CIS countries plays a much more modest role. The exception is Belarus, where the estimated share was 9% of GDP in 2005, mainly due to the oil refining industry, which accounted for 22% of industrial production. In Ukraine the share of the energy sector in GDP is about 7.5% despite the traditionally important role of the country's coal industry.

[12] http://www.expert.ru/printissues/kazakhstan/2003/01/01ka-neft/

In other countries the energy sector accounts for less than 5% of GDP. Especially low contributions were recorded in Moldova, Tajikistan and Georgia – countries that do not have very developed heavy industry.

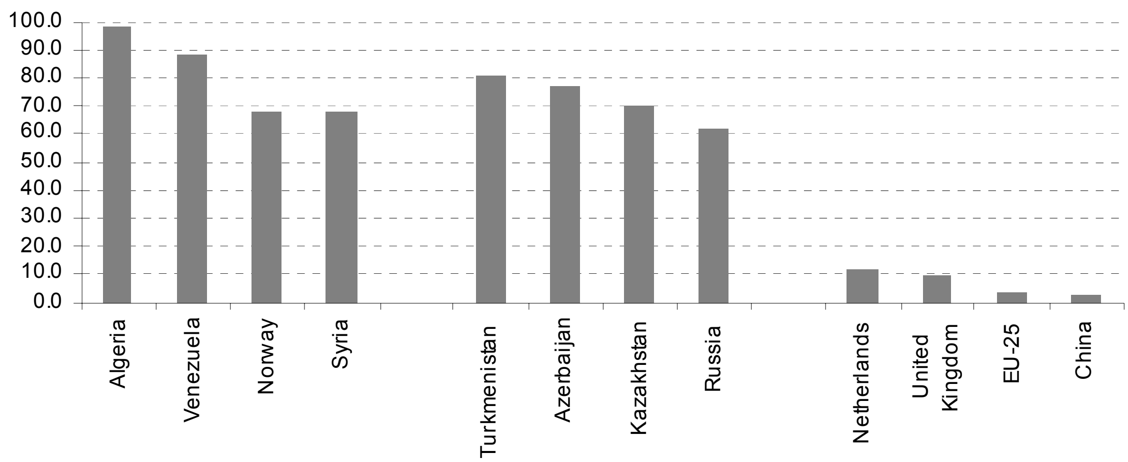
3.4.2 Energy in foreign trade

3.4.2.1 Energy exports

Net energy exporters

For Azerbaijan, Kazakhstan, Russia and Turkmenistan energy products constitute the main part of their exports. This is particularly visible in Azerbaijan (where recent data may indicate the highest share) and in Turkmenistan (81% in 2000, but lack of more recent data make trend analysis impossible). Figure 3.2 shows that these figures are comparable to those observed in some other major oil and gas exporters.

Figure 3.2 Share of energy goods in total merchandize exports in 2005, (%)



Note. 2000 data for Turkmenistan.

Source: COMTRADE.

As far as Russia and Kazakhstan are concerned, the share of energy goods in their export value has almost doubled since 1998. In Kazakhstan this share increased from below 37% in 1998 to above 70% in 2005. The growth rates of energy exports in Russia were just a bit slower. The rapidly rising importance of energy commodities in exports resulted from two factors: the major increase in the prices of these commodities and rising export volumes.

Oil and petroleum products dominate the structure of energy exports (Table 3.4). Turkmenistan is an exception, with the dominant role of natural gas. Russia represents not only the highest export volumes but also the most diversified structure of energy exports, with a substantial role played by both oil and gas. Still the structure of Russia's energy exports has changed significantly, as the ratio between oil and petroleum products and gas grew from 1:1 in 1998 to 3.3:1 in 2006. This was partly caused by growing volumes of oil exports, while volumes of gas exports remained almost unchanged. The second important factor was the different price dynamics of these two commodities – the prices of gas exports to CIS countries lagged behind the prices of oil exports until 2006.

Kazakhstani exports have been dominated by oil and oil products, with a decline in coal exports (which were important in 1998) and a slight increase in the role of gas exports. Azerbaijani energy exports have so far consisted almost entirely of oil (above 99%).

Table 3.4 Energy exports, its share in total merchandise exports and structure by product, (%)

		1998	2000	2002	2004	2006
Azerbaijan	energy products, billion USD	0.4	1.5	1.9	3.0	5.4
	energy products, % share in total exports	68.9	85.1	88.9	82.2	84.6
	coal (% of energy exports)	0.0	0.0	0.0	0.0	0.0
	oil and petroleum products	94.0	98.7	99.0	99.8	99.5
	Gas	0.0	0.0	0.1	0.1	0.2
	electricity	6.0	1.3	1.0	0.2	0.4
Kazakhstan	energy products, billion USD	1.9	4.6	5.6	12.9	26.3
	energy products, % share in total exports	36.7	52.0	58.2	64.8	68.7
	coal (% of energy exports)	16.8	3.6	3.1	2.1	1.9
	oil and petroleum products	81.8	95.5	91.7	92.0	94.6
	Gas	1.2	0.9	5.0	5.4	3.4
	electricity	0.1	0.0	0.2	0.5	0.2
Russia	energy products, billion USD	28.2	52.8	55.7	99.4	189.2
	energy products, % share in total exports	39.0	51.3	52.2	54.7	62.7
	coal (% of energy exports)	2.5	2.3	2.4	3.3	2.4
	oil and petroleum products	48.5	65.3	69.4	74.9	74.6
	gas	47.6	32.2	27.8	21.3	22.6
	electricity	1.4	0.3	0.5	0.5	0.4
Turkmenistan	energy products, billion USD	0.3	2.0	--	--	--
	energy products, % share in total exports	58.5	81.0	--	--	--
	coal (% of energy exports)	0.0	0.0	--	--	--
	oil and petroleum products	70.8	37.7	--	--	--
	gas	20.1	61.5	--	--	--
	electricity	9.1	0.8	--	--	--
Armenia	energy products, million USD	--	20.6	13.4	19.8	19.5
	energy products, % share in total exports	--	7.0	2.8	2.8	1.9
	coal (% of energy exports)	--	0.0	0.0	0.0	0.0
	oil and petroleum products	--	0.4	0.0	0.3	0.5
	Gas	--	0.0	0.0	3.6	10.3
	Electricity	--	99.6	100.0	96.1	89.2
Belarus	energy products, billion USD	0.6	1.5	1.6	3.7	7.6
	energy products, % share in total exports	7.8	19.8	20.3	26.9	38.3

		1998	2000	2002	2004	2006
	coal (% of energy exports)	0.3	0.1	0.2	0.2	0.1
	oil and petroleum products	99.0	98.9	98.8	97.3	96.9
	Gas	0.7	1.1	0.8	2.1	2.6
	Electricity	0.0	0.0	0.3	0.5	0.4
Georgia	energy products, million USD	21.5	27.6	18.9	22.8	29.5
	energy products, % share in total exports	11.2	8.4	5.5	3.5	3.0
	coal (% of energy exports)	0.3	0.6	0.2	0.0	0.7
	oil and petroleum products	69.5	69.5	55.7	81.9	89.6
	Gas	4.8	3.7	9.4	18.0	2.0
	Electricity	25.4	26.2	34.6	0.0	7.8
Kyrgyzstan	energy products, million USD	29.0	82.5	58.2	81.2	148.9
	energy products, % share in total exports	5.6	16.4	12.6	11.3	18.7
	coal (% of energy exports)	1.7	0.4	1.3	0.4	0.2
	oil and petroleum products	10.0	2.9	60.8	72.4	83.0
	Gas	0.0	0.1	0.0	0.3	0.0
	Electricity	88.3	96.7	37.9	27.0	16.8
Moldova	energy products, million USD	0.0	0.4	0.1	15.5	2.4
	energy products, % share in total exports	0.0	0.1	0.0	1.6	0.2
	coal (% of energy exports)	0.0	0.0	0.6	0.6	0.2
	oil and petroleum products	100.0	9.4	54.0	5.8	97.7
	Gas	0.0	90.6	45.4	2.7	1.9
	Electricity	0.0	0.0	0.0	90.9	0.2
Tajikistan	electricity, million USD	103	182	67	58	49
	electricity, % share in total exports	17.6	21.7	9.7	6.3	3.5
Ukraine	energy products, billion USD	0.5	0.8	1.6	3.4	2.6
	energy products, % share in total exports	4.1	5.5	9.2	10.4	6.7
	coal (% of energy exports)	16.9	14.9	10.0	26.2	10.5
	oil and petroleum products	46.0	52.9	76.5	55.8	75.6
	Gas	10.0	21.1	9.2	14.6	2.8
	Electricity	27.1	11.1	4.3	3.4	11.0

Source: COMTRADE, Russian customs committee, and National Bank of Tajikistan.

Net energy importers

The group of CIS countries that are net energy importers varies greatly with respect to the role of individual energy products in their export structure. Belarus witnessed rapid growth in exports of oil and petroleum products (domestic oil production and processing oil products from Russian crude), which resulted in an increase in the share of energy products in total merchandise exports from 8% in 1998 to as much as 38% in 2006. This was supported by favourable terms of crude oil imports from Russia and further re-export of processed petroleum products. The situation changed in 2007 when Belarus was forced to introduce export tariffs on petroleum products equal to Russian ones, while import prices for oil also grew due to the introduction of export tariffs by Russia (for discussion see e.g. Giucci and Kikhner, 2007).

Until 2000 Kyrgyzstan mainly exported electricity (15% of its total merchandise exports in 2000). Its share has been declining since then, down to 3.2% of total exports by 2006. This trend was compensated by strong growth of oil and petroleum products exports, which increased their share in total exports to 15.5% by 2006. However, these were in fact re-exports of Russian and Kazakhstani petroleum products to the American Manas air base.

Moldova, Armenia and Georgia export negligible amounts of energy resources.

After hitting a level of close to a 12% share in total exports in 2003, the role of energy products has been declining in total Ukrainian exports. Ukraine exports all kinds of energy products and their composition varies greatly from year to year. The coal industry amounted to 10.5% of energy exports in 2006 (down from 26% in 2004). Oil and petroleum products in 2006 amounted to 76% of energy exports, which is much more than it was in 1998 but less than in 2002. The latter can be explained by the introduction of world prices for Russian oil exported to Ukraine that year. The hikes in gas prices by Russia has contributed much to the reduction of gas exports from Ukraine, as it became more rational to consume natural gas extracted in Ukraine instead of exporting it and importing more Russian gas. Exports of electricity increased in 2006 and reached the level of the 1999-2000 period.

Oil and oil products were sometimes exported within the grey economy, by means of non-transparent contracts or legal schemes, which minimised taxes (using trading subsidiaries in regions offering special local tax exemptions, off-shore companies[13], etc.) and transfer pricing, which could also distort statistics (ITIC, 2006; Tabata, 2006). For example, export prices to some offshore buyers could also be lower than world prices (a difference of around USD 80-100 per ton of oil products in Belarus sold directly to the Netherlands or to its off-shores [14] (IMF, 2007b). Although the scale of such practices seems to have diminished over time, they have not been fully eliminated (IMF, 2007b; Ahrend and Tompson, 2006).

Contribution to export growth

Energy exports used to be the main force behind export growth for countries such as Azerbaijan, Kazakhstan, Russia, and Turkmenistan (Table 3.5). This was owed to two distinct processes – rising export volumes and / or increasing export prices. For example, in 2006 energy products contributed 47.2% to export growth in Azerbaijan, while the total growth of exports was 46.6%, implying stagnation of non-energy exports. A similar situation occurred in Turkmenistan in 2000 when non-energy exports were practically stagnant and almost the whole increase in total exports could be attributed to energy commodities.

[13] See http://www.opec.ru/point_doc.asp?d_no=31091 and discussion in chapter 5.

[14] See http://liberty-belarus.info/content/view/1460/34/.

In Kazakhstan and – to a somewhat lesser extent in Russia – energy products were also the main drivers of export growth, particularly during 2003-2005. However, in 2006 their contribution declined slightly, which implies stronger growth in non-energy exports, especially in Kazakhstan.

Table 3.5 Total export growth and contributions of energy exports (% of previous year total exports)

		1999	2000	2001	2002	2003	2004	2005	2006
Armenia	Growth of total exports	--	27.0	14.2	45.1	37.6	6.2	31.6	7.1
	due to energy products	--	0.6	-1.2	-1.1	-0.5	1.3	-0.1	0.1
Azerbaijan	Growth of total exports	53.3	87.8	32.6	-6.3	19.6	39.5	20.2	46.6
	due to energy products	51.6	81.2	36.0	-8.0	13.9	28.7	10.1	47.2
Belarus	Growth of total exports	-16.4	24.1	1.6	7.7	24.0	38.3	16.2	23.5
	due to energy products	-0.2	15.5	-1.7	4.0	7.1	15.1	13.5	12.6
Georgia	Growth of total exports	23.8	38.5	-3.0	8.2	34.4	39.4	33.5	14.5
	due to energy products	0.9	1.9	0.0	-2.7	1.3	-0.1	0.8	0.2
Kazakhstan	Growth of total exports	12.8	49.7	-2.0	12.1	33.9	54.1	39.8	37.3
	due to energy products	12.5	34.1	2.2	10.0	23.7	38.6	33.2	24.3
Kyrgyzstan	Growth of total exports	-11.6	11.2	-5.6	-3.3	26.4	23.5	-6.5	18.2
	due to energy products	4.8	6.4	-5.6	0.8	2.0	2.4	-0.3	10.4
Moldova	Growth of total exports	-26.5	1.6	20.5	13.3	22.7	24.8	10.6	-3.6
	due to energy products	0.0	0.1	-0.1	0.0	0.7	1.4	-1.4	0.1
Russia	Growth of total exports	0.8	41.4	-2.4	6.0	25.2	35.9	32.8	25.0
	due to energy products	4.2	29.7	0.6	2.2	14.2	21.3	26.9	17.0
Turkmenistan	Growth of total exports	99.9	111.1	--	--	--	--	--	--
	due to energy products	69.7	106.9	--	--	--	--	--	--
Ukraine	Growth of total exports	-8.4	25.8	11.6	10.2	28.7	41.6	4.8	12.1
	due to energy products	1.43	0.9	2.6	2.8	6.2	2.8	-0.2	-2.3

Note: There is no information on Uzbekistan. The contribution of energy exports in total export growth (second row for each country) is calculated as the ratio between the increase in the value of exports of energy products to the value of total exports in the previous year. Thus, if the contribution to growth calculated in such a way is equal to total export growth rate this implies stagnation of non-energy exports.

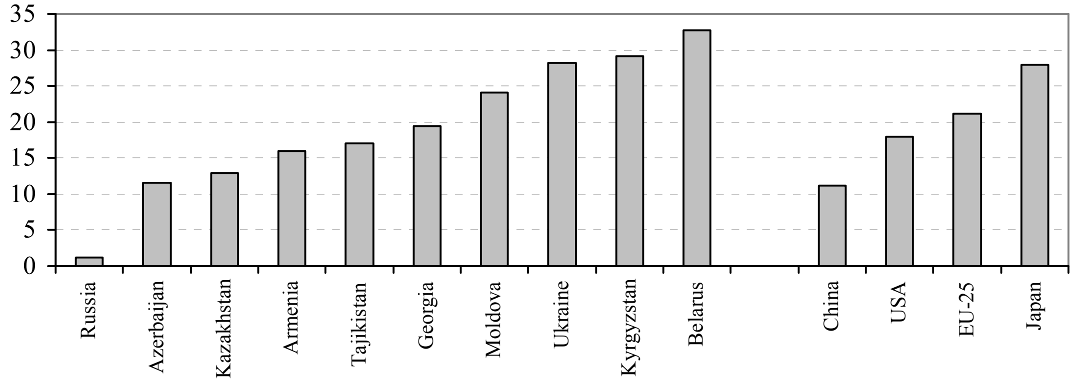
Source: Own calculations based on COMTRADE and the Russian customs committee.

Within the category of net energy importers, two groups of countries can be distinguished. In Belarus and Kyrgyzstan energy exports contribute substantially to the total export growth of these countries. As far as Belarus is concerned, in 2005 energy products (mainly oil products) contributed 13.5 percentage points out of the total 16.2% growth rate, a similar ratio to that observed in Kazakhstan and Russia. In other CIS countries – Armenia, Georgia, Moldova, Ukraine – the contribution of energy goods to total export growth is negligible.

3.4.2.2 Imports of energy resources

Energy imports in Belarus, Kyrgyzstan and Ukraine account for 28-33% of total imports, a relatively high figure by international comparison (See figure 3.3). Such a level could be explained by industrial structure, rising living standards, as well as by the high energy intensity of these economies (in the case of Kyrgyzstan, it also reflects imports of petroleum products that are later re-exported to the US air base). Shares of energy imports of other CIS countries typically fluctuate between 10-20%, with the exception of Russia (and probably Turkmenistan), which imports hardly any energy products.

Figure 3.3 Share of energy goods in total merchandise imports, 2005 (%)



Note: 2005 data for the EU25.

Sources: Comtrade and the National Bank of Tajikistan.

However, if one looks at the changes in the dynamics of energy imports, one can identify two groups of countries: one where energy imports relative to total imports increased during 1998-2006, and one where this ratio declined. The share of energy imports fell in Armenia, Georgia, Kazakhstan, Moldova, Russia and Ukraine. In Ukraine, part of imports has been substituted by domestic energy production (for example, in the gas sector). Russia and Turkmenistan have remained mostly self-sufficient in using energy resources. Kazakhstan's share of energy imports declined only modestly, as the capacities of oil refineries in Kazakhstan allowed the processing of additional oil imported from Russia, while locally produced crude oil was exported.

The decline in Georgia, Armenia, and Moldova can be explained by the absence of a developed refinery sector and energy-intensive industries. Besides, these countries started to adjust to the higher prices of imported energy (their import prices increased earlier than elsewhere in the CIS).

In Azerbaijan, Belarus and Kyrgyzstan, the share of energy imports increased. This is explained by the economic growth of these countries, growing energy demand and also low import prices from Russia. However, in 2007 this trend changed in Azerbaijan after it stopped buying gas from Russia, switching to domestically extracted gas.

Belarus witnessed a steady growth in the share of energy goods imports (especially oil, due to the favourable conditions of oil imports from Russia) from 23% in 1999 to 33% in 2005 (Table 3.6). At the same time the share of gas in energy imports was falling (although volumes stayed broadly constant). It will be interesting to see the extent to which new terms of oil trade with Russia will affect import statistics in the future.

Table 3.6 Energy imports, share in total merchandise imports and structure by product, (%)

		1998	2000	2002	2004	2006
Armenia	energy products, million USD	--	174.4	168.8	206.9	350.5
	energy products, % share in total imports	--	20.8	17.9	15.9	16.0
	coal (% of energy imports)	--	0.0	0.0	0.0	0.0

	oil and petroleum products	--	44.5	58.8	59.8	51.4
	Gas	--	49.6	37.8	38.0	46.1
	Electricity	--	5.9	3.4	2.2	2.5
Azerbaijan	energy products, billion USD	62.9	57.1	292.6	401.7	612.7
	energy products, % share in total imports	5.8	4.9	17.6	11.4	11.6
	coal (% of energy imports)	0.1	0.1	0.2	0.2	0.7
	oil and petroleum products	43.3	29.6	3.7	22.2	14.2
	Gas	1.1	8.1	73.2	62.9	76.0
	Electricity	55.5	62.3	22.9	14.7	9.2
Belarus	energy products, billion USD	2.0	2.6	2.3	4.5	7.3
	energy products, % share in total imports	23.8	30.4	25.7	27.7	32.8
	coal (% of energy imports)	2.3	1.5	0.8	0.8	0.3
	oil and petroleum products	45.5	71.7	68.9	75.9	83.4
	Gas	40.3	21.9	24.3	21.5	14.6
	Electricity	11.9	5.0	6.0	1.7	1.7
Georgia	energy products, million USD	215.6	137.8	165.2	318.6	713.2
	energy products, % share in total imports	24.5	21.2	20.8	17.3	19.4
	coal (% of energy imports)	0.9	1.0	1.4	4.5	1.5
	oil and petroleum products	61.9	52.8	56.2	60.2	65.3
	Gas	25.3	35.2	31.7	25.2	29.9
	Electricity	11.9	11.0	10.7	10.1	3.3
Kazakhstan	energy products, billion USD	0.6	0.6	0.8	1.7	3.1
	energy products, % share in total imports	15.1	11.2	11.5	13.4	12.9
	coal (% of energy imports)	11.2	10.0	6.7	11.4	4.3
	oil and petroleum products	54.9	60.8	57.5	62.4	77.9
	Gas	18.7	22.2	32.0	22.0	15.5
	Electricity	15.2	7.0	3.8	4.2	2.3
Kyrgyzstan	energy products, million USD	208.7	128.6	152.0	256.3	502.1
	energy products, % share in total imports	24.7	23.2	26.2	27.2	29.2
	coal (% of energy imports)	8.5	8.6	9.2	7.1	3.7
	oil and petroleum products	52.0	58.9	56.4	79.3	87.6
	Gas	35.6	26.6	28.1	13.5	8.7
	Electricity	3.8	5.9	6.4	0.1	0.0
Moldova	energy products, million USD	319.5	251.9	231.4	370.6	649.7
	energy products, % share in total imports	31.2	32.4	22.3	20.9	24.1
	coal (% of energy imports)	7.0	1.8	2.1	2.6	1.9
	oil and petroleum products	38.5	43.0	44.2	54.5	53.2

	Gas	35.3	36.9	43.6	30.7	33.6
	electricity	19.2	18.4	10.2	12.2	11.3
Russia	energy products, billion USD	1.5	1.5	1.0	1.8	1.7
	energy products, % share in total imports	3.3	4.4	2.2	2.4	1.2
	Coal (% of energy imports)	13.1	8.5	15.3	16.0	23.9
	Oil and petroleum products	79.0	54.3	67.5	49.0	71.2
	Gas	5.3	36.5	11.9	26.8	0.2
	Electricity	2.6	0.7	5.4	8.2	4.7
Tajikistan	energy products, million USD	233	383	174	200	293
	energy products, % share in total imports	32.7	44.5	25.3	14.5	17.0
	Coal (% of energy imports)	n/a	n/a	n/a	n/a	n/a
	oil and petroleum products	32.6	17.8	40.0	53.5	65.3
	Gas	17.3	17.1	12.8	14.0	11.9
	Electricity	50.1	65.2	47.2	32.6	22.8
Turkmenistan	energy products, million USD	46.5	21.4	--	--	--
	energy products, % share in total imports	4.6	1.2	--	--	--
	Coal (% of energy imports)	0.0	0.1	--	--	--
	oil and petroleum products	99.9	97.8	--	--	--
	Gas	0.0	2.1	--	--	--
	Electricity	0.0	0.0	--	--	--
Ukraine	energy products, billion USD	5.9	6.0	6.7	9.8	12.7
	energy products, % share in total imports	40.5	43.0	39.2	33.6	28.2
	Coal (% of energy imports)	6.5	4.4	4.3	11.7	7.7
	oil and petroleum products	31.4	40.0	42.7	50.9	54.6
	Gas	59.7	55.6	52.9	37.4	37.7
	Electricity	2.4	0.0	0.0	0.0	0.0

Source: COMTRADE, Russian customs committee and National Bank of Tajikistan.

3.4.3 Contribution to fiscal revenues

The growing volume of oil extraction and high world oil prices has brought considerable oil-related fiscal revenues to energy producers. For example, the Russian federal budget depends heavily on oil- and gas-related revenues. The exact estimation of oil-related revenues is difficult as, apart from oil export duties and resource extraction taxes, energy companies also pay other taxes indirectly dependent on size of oil production and export and oil prices. As the IMF (2007a) noted, even in the new budget framework (aimed at ensuring stability of the non-oil budget – see section 4.4 for an in-depth discussion) corporate income tax and dividend revenues from oil, as well as extraction tax revenues accruing to the regional governments, will remain excluded from the stabilisation fund mechanism and accrue to the budget as non-oil revenue. The IMF (2007a) reports the fiscal oil revenues of the general government at just below 13% of GDP in 2005-2006, close to one third of total general government revenues. This role is much higher in the federal budget, where oil revenues estimated at 11.2% of GDP in 2006 were close to half of the total (23.4% of GDP).

In Azerbaijan, by 2006 the oil-related revenues of the central budged exceeded non-oil related revenues and their role was expected to increase further in 2007. In Kazakhstan, the share of oil-related revenues in general government total revenues increased from 24% (or 6% of GDP) in 2003 to almost 37% (10% of GDP) in 2006 but was expected to decline somewhat in subsequent years, stabilising at around 8% of GDP.

More details on the fiscal importance of energy-related revenues in Azerbaijan, Kazakhstan and Russia can be found in section 4.4 of this report.

Other CIS countries also benefit from their energy sectors. For example, transit countries collect transit revenues (which are also used as an instrument for negotiating lower import prices).

In Belarus, 2006 transit revenues amounted to USD 235 million, of which the budget received USD 52 million. In 2007, transit revenues were projected at USD 393 million, in 2008-2010 – USD 402 million a year (compared to USD 16 billion of total budget revenues in 2006). Revenues from transit account for a quite significant share of exports of services (around 13.3% in 2006). Revenues from oil transit amounted to USD 180 million, of which payments to the state budget were USD 44 million. Oil refining and exports of oil products also bring substantial budget revenues. Gas and electricity companies together supply around 20% of all budget revenues. According to some estimates, budget revenues from the oil refining business amounted to approximately USD 3 billion (see Belarus country background for details). These revenues have helped the government to support population income and subsidise enterprises without implementing any serious economic reforms.

In several CIS countries the fiscal role of the energy sector is not easy to grasp. For a long time poor bill collection, payments in kind and arrears caused the spread of quasi fiscal activities (QFA), which led in turn to quasi fiscal deficits. Thus, in many cases true energy sector relations vis-à-vis the budget are quite complicated (see section 4.5 for details).

3.4.4 FDI in the CIS economies and the energy sector

Resource rich countries have attracted the largest FDI inflows. For a long time FDI in these countries was limited mostly to the energy sector and only recently started to flow to other sectors. In Russia and Kazakhstan, for example, after 2004 non-energy sectors have started to attract increasing investment inflows.

More generally, FDI inflows depend on the investment climate and factors such as the rule of law, transparency and corporate governance (Shiells, 2003), conditions for doing business (World Bank, 2008) and national competitiveness (WEF, 2007). This can partly explain why Georgia, Armenia and Ukraine attracted more FDI per capita than Belarus. Besides, different international organisations estimate FDI flows and stocks differently, as well as macroeconomic, microeconomic and legal conditions for doing business (Table 3.7). In two CIS countries (Belarus, and Russia) FDI performance up to 2006 was below estimated FDI potential.

Azerbaijan was one of the most successful CIS countries in attracting FDI mainly due to its significant oil and gas reserves, with inward FDI flows averaging about USD 900 million annually during 1997–2001 (equivalent to about 20% of average annual GDP). Inward FDI flows, mostly into the oil sector, accounted for about 70% of gross capital formation during this period (Shiells, 2003). Oil sector inward investment increased substantially in 2002, after the sanctioning of the Baku–Tbilisi–Ceyhan (BTC) pipeline project and the first phase of full-field development of the Azeri–Chirag–Guneshi (ACG) fields. Cumulative net FDI inflows in Azerbaijan increased from 26% of GDP in 2002 to 67% in 2006. By 2006, FDI per capita amounted to USD 1,705, the best result in CIS countries (Table 3.7), although since 2005 inward FDI has started to decline.

Table 3.7 FDI inflows to CIS countries & indicators of an the investment climate

Country	EBRD		UNCTAD				Global Competitiveness Index, 2007-2008
	Cumulative, 1995-2006, USD million	FDI per capita, USD	FDI stocks inward, USD million, 1990-2006	% of GDP, 2006	Inward FDI Performance Index*, 2005	Inward FDI Potential Index*, 2005	
Armenia	1,320	431	1705	27	37	77	93
Azerbaijan	13,875	1,705	13275	67	1	65	66
Belarus	2,220	223	2734	7	117	47	-
Georgia	2,287	495	3367	43	16	95	90
Kazakhstan	21,093	1,402	32476	42	28	49	61
Kyrgyzstan	651	134	593	21	51	101	119
Moldova	866	204	1284	40	34	82	97
Russia	63,057	435	197682	20	89	22	58
Tajikistan	394	61	645	23	33	109	117
Turkmenistan	n.a.	n.a.	3124	14	n.a.	n.a.	-
Ukraine	15,677	327	22514	21	35	48	73
Uzbekistan	n.a.	n.a.	1356	8	114	111	62

* *Note:* UNCTAD benchmarks inward FDI performance and potential, ranking countries by how they do in attracting inward direct investment. Comparing the two indices one can draw up a four-fold matrix of inward FDI performance and potential: front-runners – countries with high FDI potential and performance; above potential – countries with low FDI potential but strong FDI performance; below potential – countries with high FDI potential but low FDI performance; under-performers – countries with both low FDI potential and performance.

Source: EBRD (2007), UNCTAD (2006), WEF (2007).

Kazakhstan has the second best result in the CIS in attracting cumulative FDI inflows and FDI per capita. By 2001, three quarters of inward FDI flows went into the oil and gas sectors (Shiells, 2003), but later the share of the energy sector fell to 61%[15]. The most FDI came from United States, Canada and Western Europe, reflecting the residence of multinational oil companies.

Russia has by far the highest cumulative stock of inward FDI, although in per capita terms it fares less well than several other smaller CIS countries. It has gone through different phases in terms of FDI inflows. During 1999–2001, following the Russian financial crisis, inward FDI flows accounted for less than 10% of gross fixed investment and FDI's contribution to economic growth was relatively limited. On a per capita basis, cumulative inward FDI flows in 1999–2001

[15] See http://www.expert.ru/printissues/kazakhstan/2003/01/01ka-neft/ (Table 2).

amounted to about USD 20 per person annually, a small fraction of levels in other advanced transition countries. However, in 2005-2006 annual FDI per capita already exceeded USD 105. On a stock basis, cumulative inward FDI flows in 1995–2006 were estimated at USD 63 billion (by the EBRD), USD 193 billion (by UNCTAD) and USD 55 billion (by Russian Rosstat), more than the cumulative stock in all other CIS countries taken together. Energy production amounted to 25% of all FDI in 2004, 11% in 2005 and 16% in 2006. However, an essential part of manufacturing (28% in 2006) is also connected with the energy sector – for example, oil refineries and the chemical industry[16]. Despite incidents of violating investors' property rights, Russia has started to attract substantial capital inflows. This reflects both an improvement in the business climate and the sustained good economic outlook for Russia (box 3.1).

Box 3.1 FDI in Russia

According to Rosstat, in 2007 Russia attracted USD 28 billion of FDI, twice the 2006 level. The main spheres of investments were the energy sector (almost half of the total), with the food industry, trade and financial sectors also playing important roles. Foreign investors were attracted by the reform of the electricity sector (RAO UES) and sell of YUKOS assets. In the electricity sector two biggest deals amounted to USD 7.7 billion (E.On acquired a share in OGK-4 and Enel – in OGK-5), and in the gas sector Enel and Eni bought Yukos assets for USD 5.8 billion. Russia has also become an important exporter of capital, with 2007 outward FDI hitting almost USD 14 billion.

Among the most important sources of inward FDI were Cyprus and the Netherlands (countries of domicile of many Russian investors) and also Germany, the UK and US.

OECD experts found that Russian laws on FDI are softer than in China and India but significantly stricter than in OECD countries. They estimated FDI restrictions in 29 OECD countries and 14 non-OECD – *FDI Regulatory Restrictiveness Index*. The obstacles for FDI were evaluated on a scale from 0 (full openness) to 1 (prohibition of FDI). The score for Russia was 0.318, compared to 0.401 in India, 0.405 in China and a 0.144 OECD average. The ranking was based on 2004 data. However, the laws on foreign investments in strategic Russian industries later became more restrictive (a new law – "On foreign investments" – and others were adopted).

The increase in FDI inflows to Russia and their current volume confirms the good prospects of economic growth and profitability of investments. Macroeconomic development, income growth (of enterprises and population), banking sector and stock market development are confirmed by relatively favourable assessments by rating agencies. On the other hand, many national and foreign entrepreneurs notice an unfavourable investment climate in Russia (which is reflected in many international research works). Therefore, growing inward FDI could be explained mainly by the high potential of investments in Russia, above all in its energy and financial sectors. Among the negative factors one can mention some problems pertaining to property rights, unpredictable 'rules of the game', high corruption (121 place among 163 countries, according to Transparency International, 2007). High administrative barriers, bureaucracy, expensive and time consuming regime of permissions, unreformed court system, lack of transparency are also of high importance.

Sources: Based on Rosstat data, OECD (2007), http://www.napi.ru/runews/runews_407_5.aspx; http://www.vedomosti.ru/newspaper/article.shtml?2008/01/14/139545.

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16 See e.g. http://www.napi.ru/runews/runews_407_5.aspx, http://www.gks.ru/free_doc/2007/b07_11/23-11n.htm , http://www.gks.ru/free_doc/2007/b07_11/23-10.htm.

Inward FDI flows into Turkmenistan, which averaged around USD 125m during 1999–2001, were mainly in the form of production sharing agreements (PSAs) in the oil sector. Later their amount was reduced even more by a restrictive investment policy (Shiells, 2003).

According to IMF estimations, in Armenia, Georgia, and Moldova, energy sector privatisation and oil pipeline construction projects accounted for most of inward FDI flows (Shiells, 2003). The experiences of the Kyrgyz Republic and Tajikistan were of inward FDI flows confined mainly to one large gold mine project in each country and limited inward FDI flows to other sectors. Ukraine's inward FDI has been more diversified, reflecting its industrial structure. The construction of the Yamal pipeline in Belarus, owned by Gazprom, is a considerable source of FDI in Belarus (34% of gross FDI inflow in 2005 and 24% in 2006 – see country background paper for details). More information on the investment climate in CIS energy sector is given in Chapter 6.

3.5 Other specific features related to the energy sector

3.5.1 Pricing of energy imports

The period 2005-2006 saw Russian gas monopolist RAO Gazprom change policy tack. After transmitting higher international oil prices into higher gas prices for EU customers (according to the contractual indexation mechanism) the company decided to limit the increasing gap between these prices and those for CIS countries (which are set individually for each CIS country).

Gas prices for EU customers became variegated and determined by different contractual terms (depending on their indexation formula, date of signature, volumes, etc.). The actual price is based on the so-called "European market formula" and depends on prices of oil and electricity but also takes delivery costs into account. During 2005, for example, Russia sold its gas to Germany at a price rising from around USD 180 per tcm in the beginning of the year to USD 250 per tcm in the last quarter. Prices for Slovenia and Slovakia were in the range of USD 180, for Poland USD 120 and the Baltic countries USD 85-90. This cannot be explained by a difference in delivery costs since the average European gas transit rate is only around 2 EUR per tcm per 100 km. The differences are rather related to the variety of contract conditions signed with the different countries at varying periods. Prices for CIS countries were typically set well below those for other European countries (Thomas, 2006).

The rapid surge of gas prices in EU markets and the interplay between Gazprom's quest to rationalise its contracts with consuming countries, the transit capacities of particular CIS countries (and resulting bargaining power), their willingness to establish joint ventures with Gazprom and other factors (including political ones) determined gas pricing for CIS purchasers. In 2006, Gazprom substantially increased prices for all CIS countries, except Belarus. Further increases came in 2007 and 2008, this time also touching Belarus (Table 3.8). Gazprom's senior officials expressed their intention to switch to 'market' prices in contracts with all CIS countries by 2011 at the latest.

Other CIS gas exporters have also gradually raised their gas export prices, including to Russia. On February 11, 2008 Gazprom, Kazmunaigaz, Uzbekneftegaz and Turkmengaz officially declared a shift to European prices for Gazprom's purchases of Caspian gas as of 2009. However, the price formula is still unclear. Gazprom representatives indicated that approximate prices would be set at a level USD 220-230 per tcm depending on the point where gas is bought (compared to around USD 60 in 2006, and USD 100 in early 2007 and around USD 150 for deliveries in 2008). This price was calculated taking into account the current prices for gas in Europe (USD 330 per tcm in Slovakia or Romania). However, bearing in mind the continuous increase in oil prices, one can assume that gas prices will grow rise to USD 400 per tcm by the end of 2008. Therefore, the price for Caspian gas may also increase.

However, netback value pricing and the concept of equal profitability of Gazprom deliveries to external and internal markets have already been challenged by high oil prices. Adopted in 2006 by the government of Russia, the concept of shifting Russian internal prices towards world levels by 2011 assumes price increases to the tune of 25% annually during 2008-2011. By 2011 this would imply netback pricing for Russian consumers (i.e. Russia would sell at the world price, USD 102.2 per tcm). But all calculations were made on the basis of an oil price of USD 54 per barrel (USD 200 per tcm for gas). With EU prices for gas at around USD 400 per tcm, domestic price increases are unlikely to match netback levels.

The price for gas deliveries to Ukraine was set in a specific manner. Gazprom previously sold its gas at "European market price" (USD 230 per tcm in 2006-2007) to RosUkrEnergo, an offshore trader, registered in Switzerland. At the same time, Gazexport (a Gazprom subsidiary) and Naftogaz Ukrainy transferred their contracts for the purchase of 56 bcm of gas in 2006 from Central Asia (Turkmenistan, Uzbekistan and Kazakhstan) to RosUkrEnergo – this gas volume equalled the volume that Ukraine planned to import in 2006. In 2006, Ukraine purchased gas from RosUkrEnergo at an average price of USD 95 per tcm (USD 130 in 2007, USD 179.5 planned for 2008).

Table 3.8 RAO Gazprom Export Price Dynamics in 2005-2008 in CIS countries

Country importing gas	Gas price before 2006, USD per tcm	Price in 2006, USD per tcm	Growth rate, 2006 vs before 2006, % change	Price in 2007, USD per tcm	Growth rate, 2007 vs 2006, % change	Price in 2008 (first quarter), USD per tcm
Azerbaijan	60	140	133	-*	-	-
Armenia	54	110	104	110	0	110
Belarus	46.68	46.68	0	100	114	119
Georgia	62	110	77	235**	114	235
Moldova	80	110 (160)	38 (100)	170	26	191
Ukraine	50	230 (95)	90	230 (130)****	37	179.5
Germany	213 (in 2005)	296	39	293	-1	370

Notes: *After a new offer to double prices and fast growth of its own gas production potential, Azerbaijan stopped buying Russian gas in 2007.

**In 2007, Georgia imported Azeri gas for USD 120 per tcm satisfying 70% of its needs; the remaining 30% was bought from Gazprom[17].

*** Since the second half of 2006 the price has been USD 160 per tcm, i.e. an average price of USD 135.

17 See http://english.peopledaily.com.cn/200612/23/eng20061223_335253.html, http://www.rosbalt.ru/2007/11/20/432972.html, http://vz.ru/economy/2006/12/22/62013.html

Source: Lysenko and Vinhas de Souza (2007) and various Internet resources.

There are various aspects of the new Gazprom price policy. In the past, below-market prices for imported energy supported a far from optimal industrial structure in the importing countries and an increase in gas prices should help to correct this and be welfare-improving. The subsidisation of CIS consumers implied significant financial losses for Gazprom, which grew substantially with increases in EU energy prices. A rough calculation for 2005, using as a benchmark estimated “netbacks” from the German border price for CIS countries, indicated that Russia had foregone almost USD 3.9 billion in export revenues. This was a 140% increase over the roughly USD 1.6 billion foregone in 2004 (Lysenko and Vinhas de Souza, 2007). On the other hand, Gazprom’s new pricing policy gave grounds for accusations of new, politically-motivated, influence. Prices of Russian supplied natural gas have become a potential tool for rewarding and punishing CIS countries depending on their policy towards Russia in general and Gazprom in particular. From yet another perspective, the pricing policy is not fully objective. Gazprom’s interests often contradict Russian state interests and also possibly to interests of wealthy individuals linked to its management (see more in chapter 6). For example, Gazprom is interested in high export prices, while the Russian government may seek to provide access for Russian companies to CIS markets (participation in privatisation, financial expansion, debt increase). This is why prices for Belarus, Moldova and Armenia are set at relatively low levels.

As a result of gradual, but inevitable, price growth the majority of CIS countries intend to modernise their enterprises in order to increase energy efficiency, diversify sources of energy supplies and develop local and renewable energy sources.

Faced with new higher gas prices, CIS countries have adopted various strategies. Since a sudden one-off price rise would constitute a shock for the economy, most CIS countries have preferred to transfer a controlling block of shares in their gas-transporting companies to Gazprom or its subsidiaries in exchange for a more gradual price increase scenario. For example, Moldova’s decision to transfer a larger part of the shares in its gas-transporting company MoldovaGaz resulted in setting the price at a level of USD 110 per tcm in the first half of 2006; however, it was later increased to USD 160 per tcm.

The doubling of the gas price for Georgia (related to the opening of the BTE gas pipeline linking Georgia with Turkey) triggered a search for alternative energy supplies. Tbilisi agreed to buy enough Azeri gas from Turkey to help meet its energy needs for 2007 (Beehner, 2007). Azeri gas was initially relatively cheap, partly due to the limited capacity of pipelines and limited options for selling it on other markets, but more recent signs suggest a substantial increase in 2008.

As for macroeconomic adjustment of energy importers to higher gas tariffs, the experience of Ukraine, Belarus, Georgia, Moldova and Armenia suggest that the actual situation is not so bad as originally expected. For example, the IMF has forecast that a 10% increase in the import price of gas would lower GDP growth by 0.4%. Other estimates have predicted even higher impacts, around 0.7% (for comparisons of different estimations see IMF, 2006).

Due to the complexity of channels through which the energy price shock is propagated, it is difficult to model the economy’s correct response. The external position of the country prior to the energy price shock (the importance of gas imports) also matters.

Lysenko and Vinhas de Souza (2007) have estimated potential GDP losses in 2007 at around 3% for Belarus in 2007, 1.1% for Moldova and 1.7% for Ukraine. So far, despite the considerable gas price increase, the graver forecasts do not seem to have materialised and the analysed countries have managed to sustain a high rate of economic growth, although inflation has accelerated – in part for other reasons (Table 3.9).

The energy shock has been compensated by a favourable export price trend (for example, in Belarus – for oil products and fertilisers; in Ukraine – for metal products). In addition, other sectors, such as services, construction and agriculture have become important engines of economic growth. Energy shocks may also improve payment discipline and price policy, stimulating large programmes for energy saving. However, further gradual increases of gas prices will be a challenge to net importing countries.

Table 3.9 Import gas prices and economic performance in Belarus, Moldova and Ukraine, 2005-2007

	Gazprom's gas price, USD per 1 tcm			GDP growth, %			Inflation end of period, %		
	2005	2006	2007	2005	2006	2007	2005	2006	2007
Belarus	47	47	100	4.0	10.0	8.2	7.9	6.6	12.1
Moldova	54	135	170	7.5	4.0	5.0	10.1	14.1	13.4
Ukraine	50	95	130	2.7	7.1	7.3	10.3	11.6	16.6

Source: Table 3.8 and IMF WEO database April 2008.

3.5.2 Energy intensity and efficiency of economies

CIS countries are energy inefficient compared to OECD countries, especially if one uses GDP calculated at market exchange rates. For example, Russian per capita consumption of primary energy is close to the OECD average, but consumption per unit of GDP is roughly nine times above the OECD average.

The dynamics of total energy supply (Table 3.10) in CIS countries show that there is a gradual growth of energy consumption per capita, which has been increasing most dynamically in Kazakhstan and Turkmenistan, although at levels still below Russia or the OECD average. At the same time the slowest growth rates can be observed in the countries with a low energy supply – Tajikistan, Kyrgyzstan, Georgia, and Armenia.

Table 3.10 Total primary energy supply per capita and GDP

	Energy supply per capita, toe per capita					Energy supply per nominal GDP, toe per USD				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Azerbaijan	1.43	1.44	1.49	1.56	1.65	3.10	2.25	1.73	1.65	1.40
Armenia	0.60	0.63	0.66	0.70	0.85	0.56	0.83	0.74	0.74	0.75
Belarus	2.45	2.50	2.61	2.73	2.72	1.64	1.19	1.73	1.61	1.46
Georgia	0.46	0.49	0.53	0.63	0.72	0.92	0.65	0.73	0.71	0.74
Kazakhstan	2.71	3.12	3.35	3.66	3.66	1.58	1.62	2.00	2.01	2.01
Kyrgyzstan	0.45	0.51	0.53	0.55	0.54	1.08	1.11	1.73	1.68	1.70
Rep, of Moldova	0.74	0.70	0.77	0.80	0.85	1.08	1.70	2.09	2.01	1.97
Tajikistan	0.49	0.52	0.51	0.52	0.53	1.16	2.19	2.43	2.32	2.24
Turkmenistan	2.82	3.46	3.54	3.26	3.38	1.78	3.97	3.58	3.14	2.95
Ukraine	2.88	2.68	2.74	2.96	3.04	2.93	2.62	3.37	3.19	3.17
Russia	4.29	4.29	4.46	4.46	4.52	1.65	1.32	2.09	1.95	1.85
China	0.90	0.97	1.10	1.25	1.32	0.90	0.90	0.92	0.85	0.83

World	1.64	1.65	1.69	1.77	1.78	0.29	0.29	0.32	0.32	0.32
OECD	4.68	4.67	4.67	4.73	4.74	0.19	0.19	0.20	0.20	0.20

Note. Total primary energy supply is equal to the sum of indigenous production and imports, excluding exports and international marine bunkers and changes in stock changes; toe – tonne of oil equivalent.

Source: IEA, *Key World Energy Statistics*, 2003–2007.

The ratio of energy consumption to GDP was growing until 2003 in most CIS countries. The growth then stopped or was even reversed, although in most countries it still exceeds 2001 levels. The exceptions are Georgia, Belarus and Azerbaijan. As far as Azerbaijan is concerned, there was a decline of the ratio of energy supply to GDP during the whole period. However, GDP per capita roughly doubled over that period and total primary energy supply (TPES) increased only slightly; therefore, the improvements took place without any conscious policies aimed at energy efficiency and were rather an adjustment (via GDP expansion) from very high levels. In fact, Azerbaijan's GDP has grown mainly due to oil exports, sometimes at the expense of other industries. The highest ratio of energy consumption to GDP was recorded by Ukraine, and was 10-fold higher than the world average in 2005.

However, the picture alters considerably if energy intensity is calculated using GDP calculated at PPP exchange rates. Using this benchmark Ukraine, the most energy intensive country, is only 2.5-fold more energy intensive than the EU25, while Armenia and Georgia are roughly at the average EU25 level (Lysenko and Vinhas de Souza, 2007). On the other hand, their relatively good performance can be explained by a low share of industry and a high share of services in GDP, rather than by progress in energy saving. In any case, Belarusian or Ukrainian economies, much more industrialised, are still well above the European level (Table 3.11).

Table 3.11 Total primary energy supply per GDP (in PPP)

	Energy supply per GDP, toe per 1000 USD (PPP)				
	2001	2002	2003	2004	2005
Azerbaijan	0.53	0.54	0.44	0.41	0.37
Armenia	0.24	0.22	0.19	0.19	0.19
Belarus	0.35	0.51	0.46	0.43	0.39
Georgia	0.18	0.24	0.22	0.24	0.24
Kazakhstan	0.47	0.62	0.53	0.53	0.53
Kyrgyzstan	0.18	0.36	0.32	0.31	0.32
Rep, of Moldova	0.34	0.49	0.54	0.50	0.45
Tajikistan	0.44	0.60	0.48	0.47	0.44
Turkmenistan	0.72	0.82	0.63	0.54	0.55
Ukraine	0.72	0.62	0.53	0.50	0.50
Russia	0.67	0.59	0.51	0.49	0.47
China	0.24	0.23	0.23	0.23	0.22
World	0.24	0.24	0.21	0.21	0.21
OECD	0.22	0.21	0.19	0.19	0.18

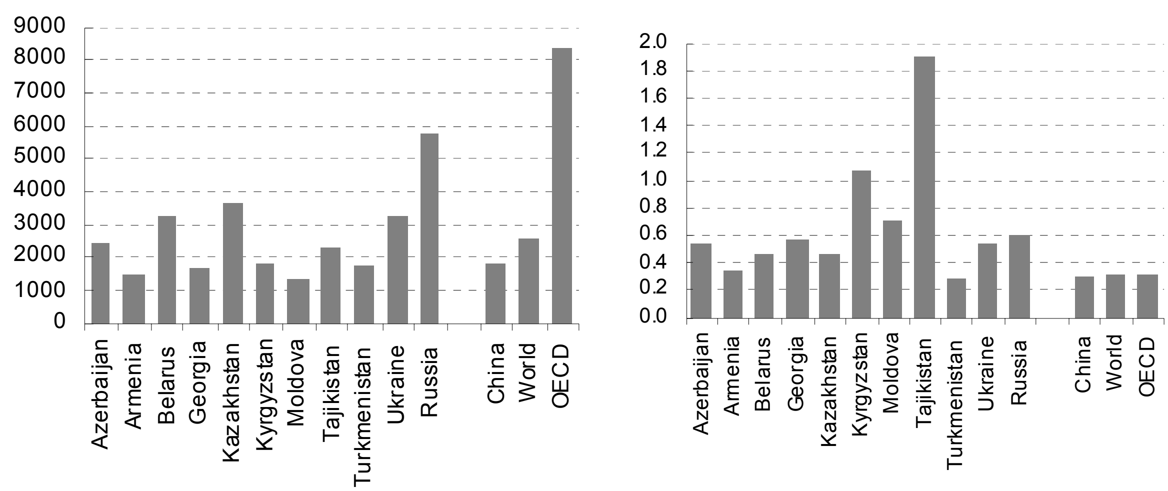
Source: own calculations based on IEA, *Key World Energy Statistics*, 2003–2007.

Electricity consumption per capita in the CIS countries does not differ much from the world average, but in comparison to Western Europe it is 3-4-fold lower. In first instance, this concerns

Moldova, Georgia and Armenia, i.e. the least developed CIS countries. The highest level of electricity consumption is recorded in Russia, followed by other countries with a large share of heavy industry – Kazakhstan, Belarus and Ukraine. However, high levels of electricity consumption can also mean energy inefficiency. This statement is the obviously true for CIS countries. As Figure 3.4 illustrates, the amount of electricity needed to produce 1 USD of GDP in CIS countries is higher than in OECD countries and the world in general. Tajikistan and Kyrgyzstan perform particularly poorly in this respect.

Emissions of CO_2 per capita are the highest in Kazakhstan and Russia. Their levels are equal to those in OECD countries. Turkmenistan, Ukraine and Belarus also record high levels of emissions (above world average). These countries have either heavy industries or oil extraction and refining. Other countries such as Armenia, Georgia, Kyrgyzstan, Moldova, Tajikistan, are characterised by low levels of emission per capita, as the role of heavy industry is less pronounced there.

Figure 3.4 Electricity consumption per capita, 2005 (MWh per capita) – left panel and electricity consumption relative to GDP (PPP), 2005 (kWh per USD of 2000) – right panel



Source: IEA, Key World Energy Statistics, 2007.

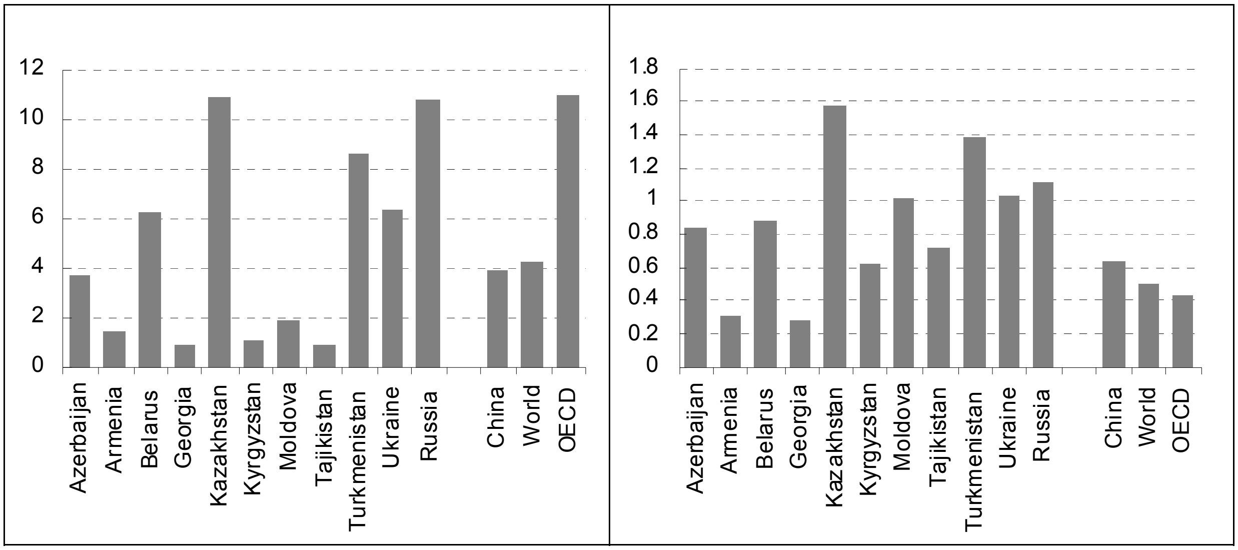
In terms of CO_2 emissions relative to GDP, the levels in OECD countries are much lower than in CIS countries, even in those that represent low levels of emissions per capita. Actually, emission per GPD in most CIS countries is even higher than in China (an economy notorious for its energy intensity and inefficiency). The reasons of this may be the following:

- The share of 'CO_2 rich' industries in CIS countries is much higher than in Western Europe;
- Inefficient use of energy resources, that leads to their extensive consumption;
- The policy of emission control is much milder in CIS countries.

Besides, low levels of emissions per capita and high per GDP simply reflect low GDP per capita.

Summing up, CIS countries are characterised by high volumes of energy consumption. If calculated per capita the levels are lower than in Western Europe. However, the efficiency of their use is also much lower. With the same amount of energy resources, OECD countries produce several times more value added than CIS countries (the gap decreases significantly if GDP at PPP is used for calculations). On a positive note, growth in energy consumption has slowed recently. As a result energy efficiency has been improving in most CIS countries for the last few years.

Figure 3.5 CO2 emissions per capita, 2005 (t per capita) – left panel and CO2 emissions per GDP PPP, 2005 (kg per USD of 2000) – right panel



Source: IEA, Key World Energy Statistics, 2007

Among the main reasons for excessive use of energy in the CIS are the inefficient system of Soviet pipelines (in the case of heating pipelines 20-30% of heat is lost), energy-intensive industries with ageing equipment, inefficient energy generating enterprises (for the same reasons), and administrative energy tariff policies, which do not stimulate saving energy. The increase in the energy import prices and expectations of further increases have prompted most countries to react and to invest in energy saving. As a rule, the more difficult the situation has been (with payments and ability to pay), the sooner countries have started to implement energy saving programmes (Armenia, Ukraine, Belarus). It remains to be seen the extent to which this factor will bring a visible improvement in energy intensity in the CIS.

The second group of factors which matter include investment climate, private sector development and the ability to cooperate with international donors. For example, Armenia and Moldova started their energy saving programmes much earlier than Ukraine or Belarus. On the other hand, energy saving in Ukraine involves foreign donors (technical assistance programmes) and private sources, while in Belarus it is limited to government funds and programmes. (See the Belarus country background for information on the ambitious energy saving programme.)

The third factor which plays a role is availability of domestic energy sources. As a result, Russia, Kazakhstan, Turkmenistan and Azerbaijan record rather slow progress in energy saving. Among the success stories, one can only mention Armenia, which by 2005 had regained its level of GDP from before 1991, while consuming less than half of the electricity and around a third of the gas it had consumed in the 1980s.

3.5.3 Other related issues

Blackouts

Reliability of electricity supply is a very important issue in CIS countries. Electric power outages can be caused by economic factors (non-payments etc.), technical (aging and outdated generating capacities and distribution networks) or human reasons (mismanagement, corruption or hidden agreements with working personal). Increasing demand for electricity, lack of investments and the short-term interest of owners in profits only underline the importance of reliable functioning of the energy sector. Although there have been no serious crises in electricity supply in CIS countries since 2000, in some of them electricity supply in 2005-2006 proved to be vulnerable[18]. Blackouts or lack of electricity could be an obstacle for economic growth.

In Russia there has been very little investment in generation since 1991 and demand for electricity has recently been increasing much faster than supply, so the market is in deficit, which the government promises to eliminate not before 2010. In 2007, the system was able to meet only 36% of new customer demand[19]. This was still considered a success as in previous years the ratio never exceeded 16%. The electricity deficit amounts to around 5% of total electricity generation capacity[20] with large regional variations. The worst situation is experienced by Moscow and the Moscow oblast', where the deficit is estimated at around 2500 MWt. The ability to transfer electricity from the energy-excessive regions to those with energy deficits has solved the problem up to now. However, in the nearest future an energy deficit could occur in the Central region, Krasnodar and Ural. Reserve capacities in most regions are also not sufficient, which leaves the threat of future blackouts.

Without progress in energy efficiency on both the supply and demand sides, the electricity sector needs considerable amounts of investment for building new stations and networks, and the government intends to spend for these purposes RUR 3 trillion[21]. However, government investment alone will not be enough, while private participation is low due to the complex investment climate problems and low electricity prices[22]. The building of new nuclear capacities (around 40 new stations are planned in the next 20-30 years) could provide a partial solution but the problem of investment financing, meeting contemporary nuclear safety standards and sources of uranium imports will have to be solved (domestic uranium reserves in Russia are not sufficient even for current consumption).

The problem of possible blackouts is also actual in some Central Asian countries (Kyrgyzstan and Tajikistan) due to unresolved disagreements with Uzbekistan and Kazakhstan as to how to use the hydropower potential of their rivers (irrigation vs. hydro generation) as well as in Georgia.

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18 Many CIS states were plagued by repetitive power cuts in the 1990s and in some cases problems continued later. The main causes were excessive use of electricity for heating and obsolete facilities.

19 Partly resulting from low end-use efficiency and lack of energy saving policy and incentives (metering, prices, etc) and partly – by economic growth and obsolete facilities.

20 http://www.expert.ru/printissues/expert/2006/21/energeticheskiy_krest_rossii/

21 http://www.rao-ees.ru/en/invest_inov/inv_progr/show.cgi?financ.htm

22 http://www.expert.ru/printissues/siberia/2007/42/elektroenergetika_sibiri/, http://www.rao-ees.ru/en/invest_inov/show.cgi?concep.htm

Spill-over effects

The strong boost to growth that rising international energy prices have given to CIS energy exporters, notably Russia, has had second round effects on other CIS countries via rising Russian (and other energy exporters) demand for imports. The strength of this impact remains an open question. Vinhas de Souza and Catrinescu (2006) conclude that the regional role of Russia (which could be considered as a proxy for energy-rich countries) as growth driver is not very strong, compared to the enlarged EU, even when the period of very high oil prices and robust domestic demand boost in Russia are included in estimations. On the other hand, in view of data limitations and model imperfections, one should be careful not to underestimate the potential impact. The spill-over effects through the trade channel may be somewhat limited for the following reasons:

- The export structure of the majority of CIS countries is not diversified and concentrated on agricultural or raw materials, with low value added. Belarus and Ukraine can be considered exceptions as these countries mainly sell manufactured goods to Russia.
- Leaving aside trade in energy commodities, intra-CIS trade linkages are not as strong as one might have expected. Since around 1998 or so one has observed a trend towards reducing trade intensity between CIS countries. High transportation costs, a lack of proper transport infrastructure, disagreements on tariff and custom policies, as well as protectionism of some countries are among the explanatory factor for this.
- Benefiting from high oil and gas prices, CIS energy exporters demand high quality investment and consumer goods, increasing their imports from non-CIS countries. For example, according to COMTRADE data in 2006 Russian imports from CIS amounted to only 16% of the total (a significant decline from levels observed before 2000), in Kazakhstan CIS countries (mostly Russia) had 47 % import share and in Azerbaijan – 13%.

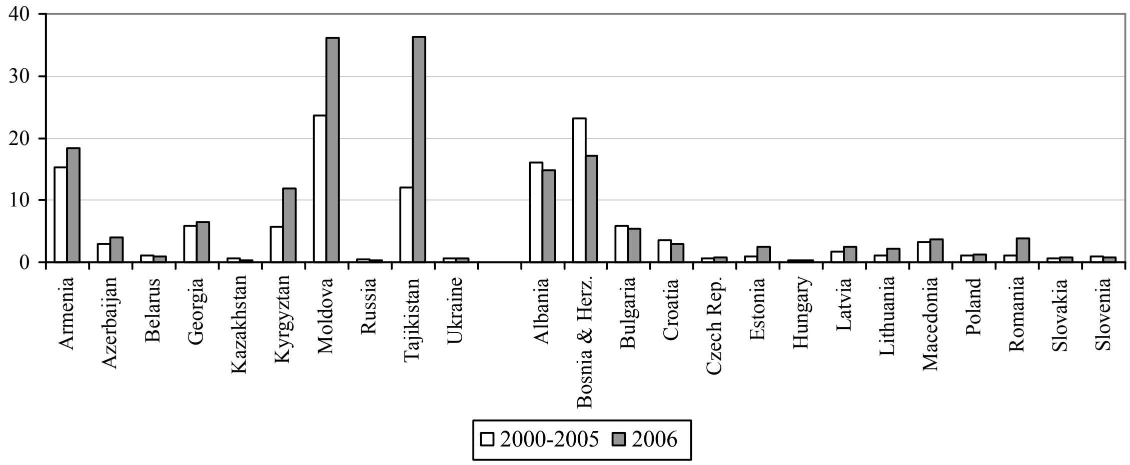
Economic growth in low-income CIS countries has been concentrated in agriculture and the raw material sectors, with a minor role played by Russian demand (Robson, 2006).

However, as pointed out e.g. by Paczynski (2007), it is possible that channels other than trade may be playing an increasingly important role in regional transmission of economic growth.

Looking at FDI flows one sees some role, particularly of Russian companies, for investing in the energy sector, but also in telecommunications and other sectors in CIS countries. Some experts describe this investment activity as mainly motivated by 'resource-seeking' or rent-seeking forces. Its role in the growth of CIS economies is yet to be revealed.

Remittances may be another important growth factor for less developed CIS countries and here the effects of Russian and Kazakh booms (and resulting labour shortages) may be relevant. Several CIS countries are characterised by high levels of remittance inflows by international comparison. According to the World Bank WDI database, in 2005-2006 remittances exceeded 10% of GDP in Moldova, Tajikistan, Armenia, and Kyrgyzstan (Figure 3.6), although the exact figures should be treated with caution due to problems in proper accounting for remittances. Part of remittances come from labour migrants based in EU countries, although CIS countries, especially Russia, also play an important role as the source of these flows. The exact share of CIS energy-rich economies in the total labour migration and remittance flows is difficult to estimate (see e.g. the discussion in Vinhas de Souza and Catrinescu, 2006; Shelburne and Palacin, 2007), but it is certainly substantial at least with respect to some countries (e.g. Tajikistan).

Figure 3.6 Remittances as a share of GDP, 2000-2006



Source: Calculations based on World Development Indicators data.

The actual impact of remittances is an empirical question. Existing literature (see e.g. Shelburne and Palacin, 2007 for a review) typically find either lack or limited effects or significant positive effects on growth and/or poverty reduction. Our growth regressions reported in section 4.3 suggest a robust positive role of remittances in driving the development of transition economies. While a detailed analysis would go beyond the scope of this report we conclude that remittances can potentially be a significant channel through which energy booms in countries such as Russia and Kazakhstan exert a positive impact on other CIS countries.

External debts

Many CIS countries rapidly increased their external debts during the 1990s; the increasing share of external debt accumulation can be considered a form of “shock absorption” strategy (Lysenko and Vinhas de Souza, 2007). IMF and World Bank (2001) analyses suggest that the key contributing factors to the rapid rise in external debt in the early transition period were energy-related arrears and primary current account deficits. External shocks, the end of Moscow’s subsidies, poor economic policy and availability of multilateral loans, biased growth projections and over-optimism explain the appearance and rise of debts (Helbing et al., 2004).

The sharp increases in prices of imported energy commodities and the intention of Gazprom to take over some gas transit assets as compensation for overdue liabilities for imported gas caused a significant improvement in payment discipline in Belarus. During 2003-2004 external debts for consumed gas and electricity were fully paid back (Belarussian Infrastructure Monitoring, 2004-2007). However, this was not the case in Ukraine where the remaining outstanding debt from the past complicated Ukraine-Russia relations, creating threats for reliable gas supply.

Many countries, in order to reduce their energy debts have chosen debt-to-equity swaps and sold part of their energy sector to Russian investors (in the case of Armenia, Moldova, Georgia, and Belarus). More information on this subject can be found in chapter 6.

The potential role of the euro in energy trade

Global oil trading has traditionally been denominated in US dollars, which became the de facto common currency of the petroleum business. In the context of EU-Russia trade, at the Helsinki EU-Russia summit in October 1999, Vladimir Putin, then the Russian Prime Minister, brought up a proposal to replace the US dollar by the euro in oil and gas trade. Since then, this proposal has been discussed again, notably in 2003 and more recently in 2008.

Russia has also tried to promote a gradual increase in the role of the rouble as a transaction currency in oil trade, which could potentially lead to the rouble also becoming one of the regional reserve currencies.

Until now these initiatives have not produced any more significant results. However, increasing numbers of oil and gas exporting countries (e.g. Iran, Venezuela) have become interested in raising the role of other currencies in the pricing of their key export commodities and have taken some steps in this direction. One example was the opening of the Iranian oil bourse in Kish in February 2008, using the Iranian rial, the euro and possibly also the Russian rouble and other currencies.

The outcome of these trends is still largely uncertain and in particular it is difficult to predict if the gradual decline of the role of the dollar as the common currency in the petroleum (and gas) business (if it actually occurs) would result in any significant rise in the role of the euro, or rather greater heterogeneity of invoicing currencies with a particular role played by the currencies of some of the large exporting countries, such as Russia.

3.6 Conclusion

The energy sector plays an important role in all CIS countries. In five countries – Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan, important producers of oil and/or gas - this role is crucial for economic development, with energy exports dominating in the export structure, energy-related revenues providing a major contribution to fiscal revenues and the energy sector accounting for between 40% of industrial output in Russia to 75% in Azerbaijan. The share of the energy sector in GDP is also high (depending on methodology, ranging from about 15% in Russia and Kazakhstan to around 37% in Azerbaijan).

The macroeconomic role of the energy sector is also important in energy-importing countries but the mechanisms and channels of its impact vary. Energy imports range from between 20% of total imports (Armenia, Georgia, Moldova) to around 30% (Ukraine, Belarus, Kyrgyzstan). Energy imports' share in GDP is also high. In the environment of growing global and regional energy prices this creates serious challenges. So far, countries have managed their payments and the energy price shock has not led to an economic decline. However, a likely continuation of increases in natural gas prices could create problems for several CIS importers.

The energy boom among large CIS energy producers (mainly in Russia) has had an impact on the improved growth prospects of other CIS countries but the magnitude of this spill-over effect is subject of controversy. Some evidence suggests that trade and investment channels do not play a very strong role. Growing demand for mainly unskilled labour in Russia maybe plays a larger role and remittances from Russia are important for economic development in such countries as Armenia, Georgia, Moldova, and Central Asian countries.

The energy sector plays an important role in attracting FDI, first of all in energy-producing countries. Up to 2004 the energy sector attracted more than half of all FDI into these countries. More recently, these economies (mainly Russia and Kazakhstan) have started to attract investments in other sectors (manufacturing, construction and services). Russian energy companies themselves are important foreign investors in other CIS countries. In turn, the energy sectors in countries such as Armenia, Moldova, Georgia, Belarus have attracted a considerable part of all accumulated FDI. In Ukraine, Tajikistan and Kyrgyzstan foreign investments go mainly into manufacturing, mining (gold, minerals and coal) and financial sector. Nevertheless, FDI flows and ratio (per capita and GDP unit) in the CIS have remained well below Central Europe.

Most CIS countries are energy inefficient although a gradual improvement is visible in several countries and most recently countries such as Belarus or Ukraine have launched energy-saving policies to reduce their energy intensity, import dependency and energy burdens.

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4. Key macroeconomic issues related to energy sector functioning

4.1 Introduction

This chapter is organised as follows. The first section looks at the question of whether energy resource wealth can be considered a positive or negative factor in assessing the long-term development prospects of the (selected) CIS countries. The next section looks at one particular mechanism often considered a potentially important detrimental factor for economic development, so-called Dutch Disease. Subsequently, fiscal policy challenges related to the modes of functioning of energy sectors in the CIS are discussed. The third section looks at the role of energy in fiscal balances, analysing non-energy balances and institutions that have been created to better manage the oil- and gas-related incomes in the energy-rich CIS economies. The fourth section looks at quasi-fiscal roles played by energy sector actors in various CIS countries that can be related e.g. to artificially low energy tariffs, non-payments, etc. The next section analyses the challenges for monetary policy in the oil- and gas-rich economies of the CIS and possible responses to these challenges. Finally, the last section of this chapter looks at redistribution of energy revenues in selected major CIS producer countries.

4.2 Resource curse or resource blessing?

4.2.1 Introduction

Historically, several economies abundant in natural resources and oil and gas in particular have experienced periods of weak economic growth and their overall level of development appears lower than one could expect given the value of their energy resources or actual values of export revenues generated in recent decades.

For example, between 1965 and 1998 OPEC countries experienced an average annual decline in their GNP per capita of 1.3 per cent, compared with 2.2 per cent average per capita growth in all lower- and middle-income countries (Gylfason, 2001). The literature on economic growth determinants tends to find a negative relation between natural resource abundance and economic growth (the most cited reference is Sachs and Warner, 1995). In his (1993) book, Richard Auty introduced the term “resource curse” to describe how countries with large natural resource deposits are not always successful in using that wealth to boost their economies.

The subsequent debate has concentrated on the following key questions:

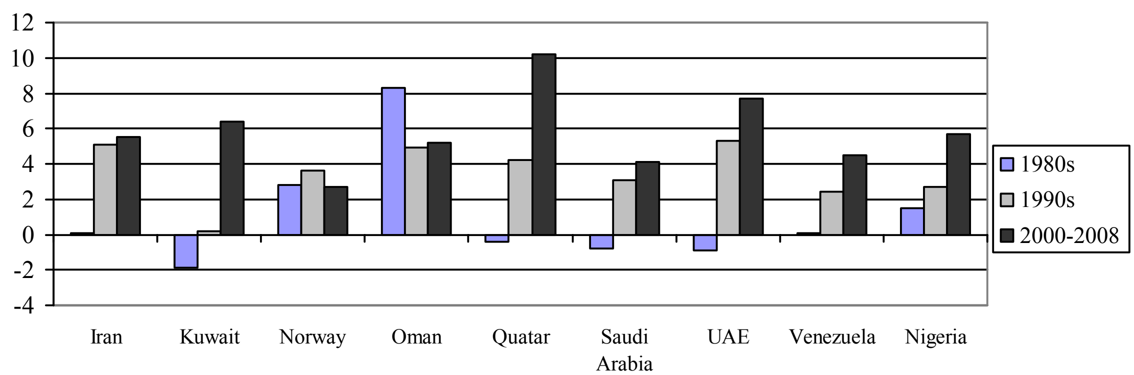
- Is the negative link between natural resources wealth and economic growth performance really robust across countries?
- What are the mechanisms through which natural resources may affect economic development?
- What determines whether particular countries are victims of resource curse and/or when they may experience a resource blessing? What is the role of domestic policies in this?

4.2.2 Resource curse evidence

On the first question, one trivial observation is that the resource curse (if it exists) is certainly not a destiny one cannot escape. In fact, no reasonable formulation of a 'resource curse' hypothesis goes that far. The examples of very successful natural resource-based development such as Norway, Australia and Canada, but also Chile, Indonesia, Malaysia and other countries illustrate the point (see Stevens, 2003 and references therein). The 'resource curse' finding of cross-country growth regressions appears to be broadly robust enough to take in various measures of countries' reliance on natural resources, be it share of primary products in exports (Sachs and Warner, 1995), labour force in primary sectors (Gylfason et al., 1999) or per capita land area (Wood and Berge, 1997). However, there are still papers claiming the hypothesis to be a 'red herring' and lacking empirical support in the data (Brunnschweiler and Bulte, 2007). An important distinction made in some of the works is that between natural resource endowment (i.e. wealth related to natural resources) and resource dependence (i.e. the extent to which they dominate the functioning of other parts of the economy, e.g. share of natural resources in exports). The former is sometimes found to be positively correlated to economic development, while only the latter may have negative effects (Ding and Field, 2005; Alexeev and Conrad, 2005; Brunnschweiler and Bulte, 2007).

Auty (2005) cautions against seeking universal answers that would be valid at all times, by noting that while the resource curse has been a feature of economic development for centuries, it has only since the 1960s been so particularly strong. Indeed, the evidence from Auty (2004) suggests that taking the period starting around 1960-1970 for the analysis may distort the broader picture. At the end of the nineteenth century resource-abundant countries, mainly new settlements and Latin American countries, performed very well. In the early 1960s, the average GDP per capita level of resource-rich countries was above that in resource-deficient countries.

Figure 4.2.1 GDP growth in selected oil-rich countries, 1980-2008 (average annual growth rates, %)



Note: Several external factors have influenced the performance of particular countries, e.g. Iran-Iraq war during the 1980s, Iraq's invasion of Kuwait in the early 1990s, etc.

Source: Calculations based on data from the IMF, World Economic Outlook database, October 2007.

Most of the empirical literature looks at the growth performance of countries starting from the 1960s up to the 1990s or around 2000 (e.g. Arezki and van der Ploeg, 2007 extend the sample up to 2000). This may matter for the findings, as since 2000 oil prices have been rising substantially (see Figure 1.1. in the Introduction). Among other potentially relevant factors one could mention increasing international integration of the world economy during the last decade. Indeed, a quick glance at the growth performance of some of the major oil producers (Figure 4.2.1) confirms that following stagnations or even recessions during the 1980s, the 1990s brought a visible improvement, while the period starting in 2000 to date has been marked by very strong growth performance indeed. This pattern was very robust for all the depicted countries with the exception of Oman and Norway, which showed broadly stable growth over the entire period 1980-2008.

One way of avoiding the problem of data limitations restricting the growth regressions to a relatively short period is to study the determinants of GDP per capita levels rather than growth rates over a specified period. In this strand of the literature, Arezki and van der Ploeg (2007) extend the framework proposed by Rodrik et al. (2004) by introducing natural resource variables to the set capturing geography, openness, and institutional quality. Their findings appear to confirm the negative impact of natural resource dependence (measured by the share of resource exports in total exports in the 1960s-1970s) but also of resource abundance (a measure of resource wealth) for per capita income level. An interesting finding is that this negative impact appears to be less severe for more open economies – in some specifications a very high level of openness turns the resource curse into a blessing.

While using per capita income levels instead of growth rates as a dependant variable solves some of the problems related to growth regressions, taking 1995 per capita income may be (partly) subject to a similar critique as analysing growth rates up to the late 1990s (if one believes that the more recent growth record of resource-rich countries has significantly improved). The non-availability of data is a problem here. For example, per capita growth rates for the countries analysed in Figure 4.2.1 in a few instances accelerated during 1995-2004 (or 1995-2000) (notably Nigeria, Iran, UAE, Qatar) compared to earlier decades, but this is not a universal trend for the whole group[23].

Summing up, while most of the empirical evidence suggests more of a negative than a positive impact of resource dependence or resource abundance on long-term growth levels or income per capita levels, the results are not always particularly robust. Furthermore, anecdotal evidence suggests that the recent decade may have been much better for oil- and gas-rich economies than the earlier period. Part of this better performance may be related to improved management of oil windfalls, following the traumatic experience of the 1980s. Notably, fiscal response appears to be much more prudent. It may well be that characteristics of available data (e.g. the short series for economic growth rates, problems with measures of quality of institutions, etc.) make a conclusive analysis more or less impossible. In addition, the analysed specifications need to make some assumptions as to the specific mechanisms via which natural resources may affect the economic development of countries. These may be debatable as well, as discussed in the next subsection.

4.2.3 The mechanisms at play

Before presenting the ‘usual suspects’ potentially transmitting resource wealth into problems of economic development one should ask the question: what are the characteristics of natural resources, and oil and gas in particular, that make them different from other forms of endowment? One obvious feature is that natural resources do not need to be produced, but extracted, a process that can be somewhat detached from other economic activities in any given country. One typically does not need substantial labour input, well functioning state institutions or a developed industrial sector to extract oil or gas. In fact, even regional armed conflicts may not matter much unless they threaten the area where the deposits are located.

[23] This assessment is based on Heston, Summers and Aten (2006) – PWT 6.2.

The second important feature is that oil, gas and several other natural resources are non-renewable. Unlike in the case of agricultural crops, there is a limited amount of oil or gas that one can extract from a single location given existing technologies and other factors. This implies that oil and gas are more akin to assets that can be easily and irreversibly depleted rather than to sources of income (Humphreys et al., 2007a).

A related distinction comes from the work of Isham et al. (2005). Among natural resources, the authors distinguish "point resources" – those extracted from a narrow geographic or economic base and plantation crops (such as cocoa / bananas) and "diffuse" commodities, coming from a broader economic and/or geographic base. Oil and gas certainly belong to the group of point resources.

This introduction allows us to present the explanations that have been suggested for resource curse.

- **Oil price volatility**. The volatility of prices of major export commodities quite naturally creates major problems of macroeconomic management of the possible terms of trade shocks and boom and bust cycles. In particular, budgetary planning is made much more difficult and sticking to fiscal austerity is not an easy task when the fiscal revenues are difficult to predict. This also affects public investment programmes, and more generally a volatile economic environment may lead to the widespread breaking of contracts. Van der Ploeg and Poelhekke (2007) provide evidence that economic growth depends negatively on volatility of unanticipated output growth and, further, that an adverse effect of resources on growth operates primarily through higher volatility. Indeed, they claim that a direct *positive* effect of resources on growth is overridden by negative an indirect *negative* effect through volatility.
- **Dutch Disease**. Named after the experience of the Netherlands after the gas discoveries in the 1970s, this mechanism works through changes in relative prices and exchange rate appreciation, leading to declining competitiveness of the manufacturing sector, that in turn brings about a decline in output and employment, and deindustrialisation. Numerous papers, including Sachs and Warner (1995), have pointed to Dutch Disease as a key channel explaining the resource curse. A detailed analysis can be found in the section 4.3 of this report.
- **Deterioration of political systems.** There may be various mechanisms where oil wealth impacts on the emergence of distorted political systems. If one considers democracy as good for growth, the problem may be that ease of taxing point-source natural resources such as oil removes the incentives to build effective systems for taxing the entire population, thus breaking the crucial link between taxation and representation and undermining democratic changes (see e.g. Isham et al., 2005.)[24]. Even if one is not convinced that democracy is good for growth, one may believe that conflicts, in particular armed conflicts, are damaging for development. In turn, several authors (see UN, 2004 or Ross, 2004, for reviews) document the mechanisms by which natural resource wealth may prompt conflicts (e.g. due to competition for rents) and sustain them (e.g. easy financing of arms).
- **Deterioration of state institutions.** Availability of high rents may lead to several other processes hindering institution building, in particular by creating space for corruption. Rent-seeking behaviour on the side of oil producing firms and public authorities (and their

24 "No taxation without representation" was a slogan that played an important role in the US's fight for independence in the second half of XVIII century.

representatives) may limit the attention paid to other policies and increase the chance of political outcomes driven by the vested interests of narrow groups rather than countries as a whole (e.g. import protection). These in turn are often believed to limit development potential.

- **Underinvestment in human capital accumulation.** The low labour-intensity of the oil and gas industry, together with political mechanisms (see above) may lead to weak demand for knowledge in resource-rich countries and underinvestment in education, which in the longer term reduces growth potential. Gylfason (2001) is one of the proponents of the view that natural capital crowding out of human capital may be at the core of problems of resource-rich nations.

The classification presented above should be viewed as illustrative rather than an exhaustive menu of available explanations for resource curse. Obviously, the details of the mechanisms may differ between authors. For example, Hausmann and Rigobon (2003) introduce another analytical approach to explain the mechanisms behind "resource curse". In their model, the sub-par growth performance of several oil-dependent economies is related to the interaction of public spending of oil income, specialisation in non-tradable goods and financial market imperfections. High specialisation of production is caused by both the level and volatility of government expenditure. This lack of diversification in turn, according to empirical evidence, tends to exacerbate resource curse.

Auty (2005) notes that while detailed analysis of single explanations has some merit, the broader and more complete picture can only be given by a synthesis of these various approaches. His (2005) paper proposes political economy models of rent-driven development as a framework that can unify the various mechanisms.

4.2.4 Turning a resource curse into a blessing?

This sub-section briefly reviews the key conclusions on the policies and other factors that limit the complications to development stemming from resource wealth or that may even turn it into a factor supporting faster economic growth. The relative importance of the various factors depends mainly on the relative importance of channels through which the resource curse mechanism can potentially work. These probably differ from one country to another and from one period to another.

Below, we summarise the set of conclusions on cures for resource curse from the recent book by Humphreys et al. (2007b).

Firstly, there is the important role of the government policies of resource-rich countries, although these are unlikely to be effective unless governments and major oil and gas companies change their behaviour. This cannot be expected to happen on its own but would need to be forced by public pressure. The extent to which such mobilisation of civil society is feasible and whether the environment of high oil prices is conducive to it remain open questions.

One important aspect concerns the nature of the contract between the governments of resource-rich countries and companies exploiting their deposits. Humphreys et al. (2007b) call for the introduction of deals that fairly divide the benefits from unexpected increases in oil prices between both partners by using formulas based on future actual prices and other uncertain outcomes. Such an approach was rarely applied for contracts signed in the 1980s and 1990s. Thus it is not surprising that governments of resource-rich nations have tended not to be able to resist the temptation to revert to populism/nationalism when prices started to strongly rise after 2000 (the example of conflicts over contracts in Kazakhstan might be seen as a good illustration of this point). Both the introduction of auction mechanisms in granting research and production licenses and transparency of negotiated deals may prove beneficial, although designing robust oil and gas contracts is not an easy task for sure.

Another issue concerns proper calculation of national wealth (there may be a substantial difference between GDP and GNP). This would not only properly focus the debate onto the gains and costs of natural resource exploration, but also help in stabilisation of public expenditures. A more detailed discussion of the various tools for this, including the stabilisation funds backed by built-in mechanisms preventing politicians from raiding them are discussed in section 4.4 of this report.

In order to limit the danger of Dutch Disease, the domestic investment and consumption financed from oil earnings should be kept under control, with some resources held abroad. Investment in human, physical and financial capital should have priority over consumption. Thus, investment in education, non-energy export sectors and agriculture may provide useful strategies.

Avoiding increases in income inequality related to energy revenues may also be an important factor supporting the long-term growth prospects of countries. The mechanisms of redistribution of oil wealth in selected CIS countries, and the challenges related to redistribution policies, are discussed in more detail in section 4.7 of this report.

Strengthening the links between government and society and the promotion of broad-based participation in decision making can limit the risks of deterioration of political institutions and internal conflicts. Obviously, this is easier said than done, in particular in countries with limited or no historical experience of functioning democracy. Transparent integration of oil- and gas-related revenues into the budget (and budget planning process) and maintaining classical forms of taxation may be instrumental in this respect.

One common feature of the above solutions is that these are long-term processes rather than solutions that can be quickly implemented. As Eifert, Gelb and Tallroth (2003) put it: “whatever approach is taken, it is clear that countries taking a long-term view will benefit the most from their oil resources”.

The general lessons above are also confirmed by more focused studies, which look at particular aspects of the interactions between natural resources and growth. For example, Arezki and van der Ploeg (2007) report an interesting finding that the negative impact of resource abundance / dependence on income per capita levels appears to be less severe for more open economies – in some specifications, a very high level of openness turns the resource curse into a blessing. In a similar vein, Mehlum et al. (2006) find quality of institutions a decisive factor – countries with weak institutions suffer more when they are rich in natural resources, while countries with good institutions are able to benefit from their resource wealth. A similar conclusion on the pivotal role of institutional setting is reached by Boschini et al. (2007). Van der Ploeg and Poelhekke (2007) find that a well developed financial sector appears to reduce resource curse.

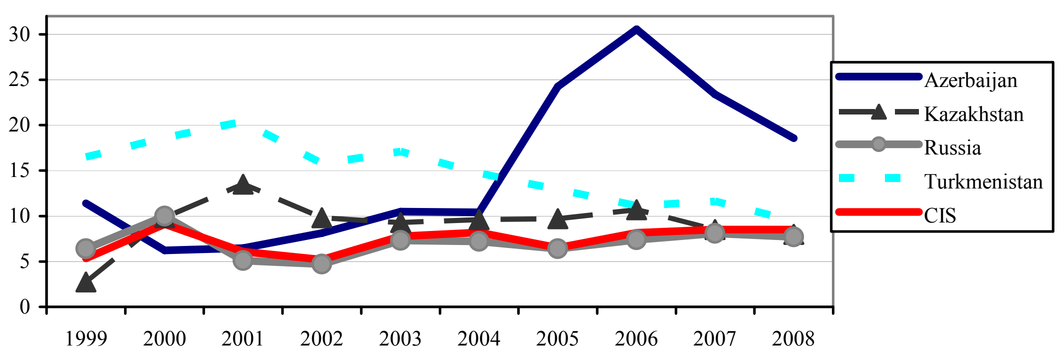
The key policy conclusions emerging from the approach suggested by Hausmann and Rigobon (2003) do not differ a great deal from those found in other strands of the literature. Containing the volatility of government spending and in some cases also its level, strengthening budget institutions and debt management are important mechanisms that can improve macroeconomic performance. Efficiency of domestic financial markets and overall policy credibility are also important from this perspective.

Among the competing views, the most popular is probably the one highlighting the importance of institutions. Oil and gas are believed to be likely causes of problems for (broadly understood) institutional development of countries by weakening the incentives for reforms, and reducing the need for well functioning tax systems and also, possibly in a more direct way, by creating conditions for struggles over oil- and gas-related rents. These institutional damages in turn negatively affect economic development – via several direct and indirect channels.

4.2.5 The CIS perspective

This section aims to continue the above discussion in the specific context of CIS countries. The first reality check is provided by the economic performance of energy-rich CIS countries compared to other CIS economies. Cumulative growth between 1998 and 2006 was fastest in Turkmenistan and Azerbaijan, followed by Armenia, Kazakhstan, Tajikistan, Belarus and Russia (see also Figure 4.2.2). The major CIS gas and oil producers are thus among the best growth performers in the CIS in recent years. Obviously, the very short data span and influences of numerous other factors do not allow one to draw any long-term conclusions from this result. The outstanding performance of Azerbaijan since 2005 (with growth in excess of 20% per annum) is clearly linked to the oil boom, which will, however, most likely be relatively short-lived (due to depletion of oil reserves).

Figure 4.2.2 Growth performance of resource-rich CIS countries 1999-2008, (annual GDP growth, %)



Source: IMF, World Economic Outlook database, April 2008, and ECFIN, European Economy, April 2008.

We also report the results of growth regressions on the sample of transition countries (including CIS economies) using the longest available time series, spanning 16 years. The detailed results are discussed in subsection 4.3.4. The main conclusion is that oil exports appeared to be positively linked to growth, in particular in recent years (coinciding with major rises in international oil prices; the effects in the early transition period (early 1990s) may have been negative)[25]. This is in line with the consensus view on the strong and positive role of the energy sector for economic growth in Russia, Azerbaijan, or Kazakhstan in recent few years (see e.g.

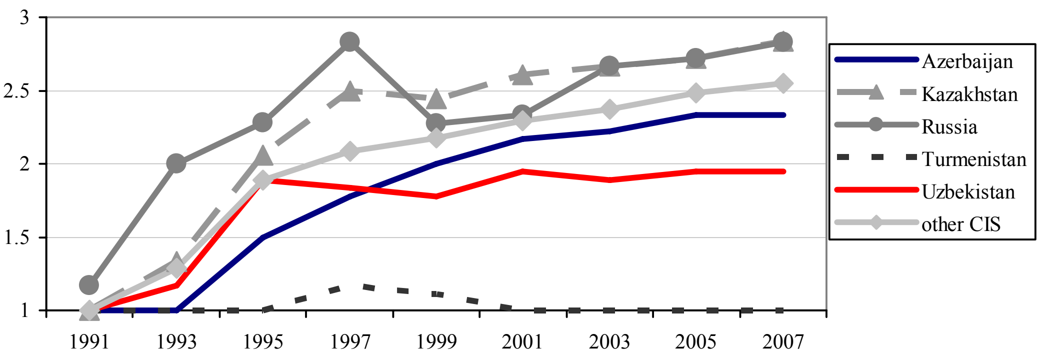
[25] A more prudent (but also more difficult) way of looking at this would be to analyse the growth performance of the non-oil economy.

IMF country reports for these economies, Ahrend, 2006; Pomfret, 2006). We note, however, that the short data span does not really allow for generalisation of this result.

While no negative consequences for economic growth appear to have materialised so far, the key question is whether this will not change in the future. Detailed analysis of the Dutch Disease mechanism is contained in the next section (4.3). Therefore, we concentrate here on other issues, notably those related to institutional factors.

One measure of overall progress in market reforms can be provided by EBRD Transition Indicators. Figure 4.2.3 compares these indices between energy-rich and other CIS economies and does not reveal any simple relations: Russia and Kazakhstan fare better than the average for non-oil CIS, Azerbaijan is slightly below the average, while Uzbekistan, and especially Turkmenistan clearly lag behind.

Figure 4.2.3 Reform patterns in CIS: average EBRD Transition Indicators for advanced reforms



Note: The figure plots simple averages for indicators for the following EBRD categories: large scale privatisation, trade and forex system, competition policy, banking reform and interest rate liberalisation, securities markets and non-banking financial institutions, overall infrastructure reform.

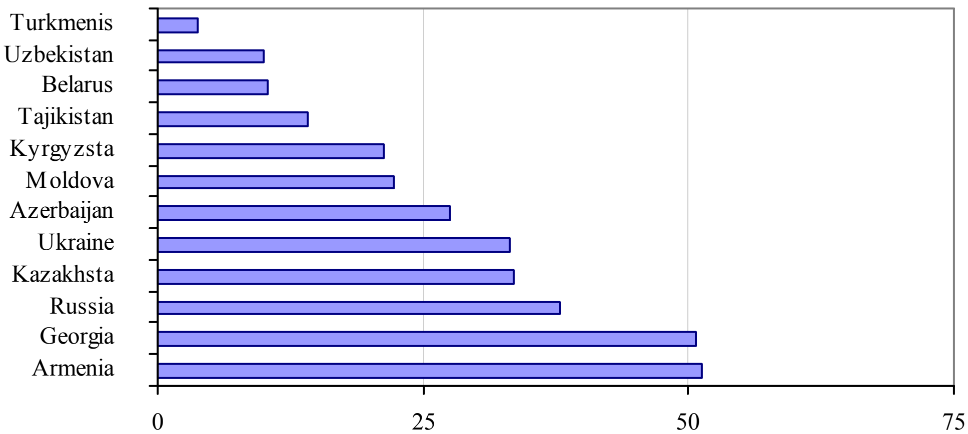
Source: EBRD.

The World Bank's Doing Business database provides yet another perspective on the institutional infrastructure that could be conducive or detrimental to economic development. Georgia and Armenia outperform other CIS economies in the 2008 ranking (with data for 2007), but energy-rich countries do not fare worse than other CIS members. In particular, Kazakhstan ranked 3rd in the CIS, Azerbaijan 6th and Russia 7th.

According to another important World Bank database, i.e. the Worldwide Governance Indicators (Kaufmann, Kraay, and Mastruzzi, 2007), Russia and Kazakhstan fare quite favourable compared to the CIS group, with only Armenia and Georgia recording higher scores (Figure 4.2.4). In contrast, Turkmenistan and Uzbekistan rank last in the group (and in fact receive some of the lowest scores globally). The results of comparison in terms of regulatory quality are broadly similar, with Kazakhstan, Azerbaijan and Russia ranked between 4th and 6th place in the CIS group.

A somewhat different picture, and less favourable for the largest oil and gas producers, emerges from an analysis of indicators related to political reforms and progress in democratisation, control of corruption, development of civil society, etc.

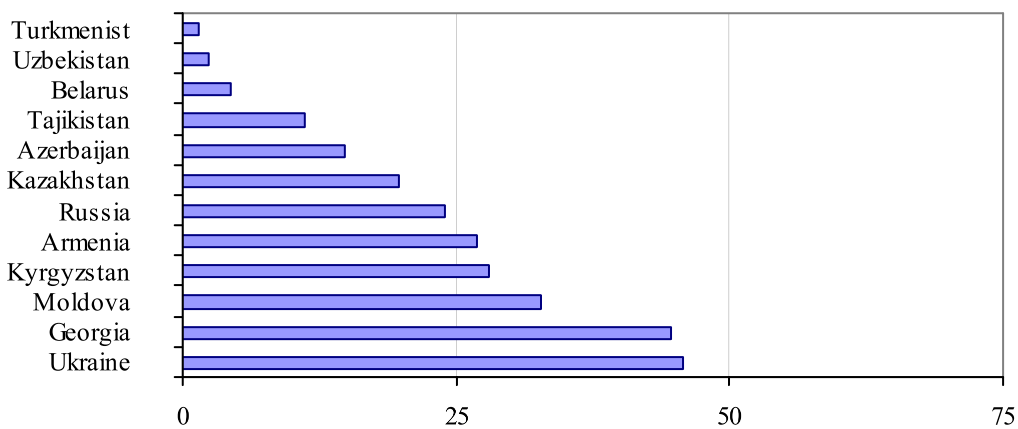
Figure 4.2.4 Ranking of CIS countries in terms of government effectiveness (2006)



Note: The figure (and two subsequent ones) plot percentile rank (among all countries covered by the database).

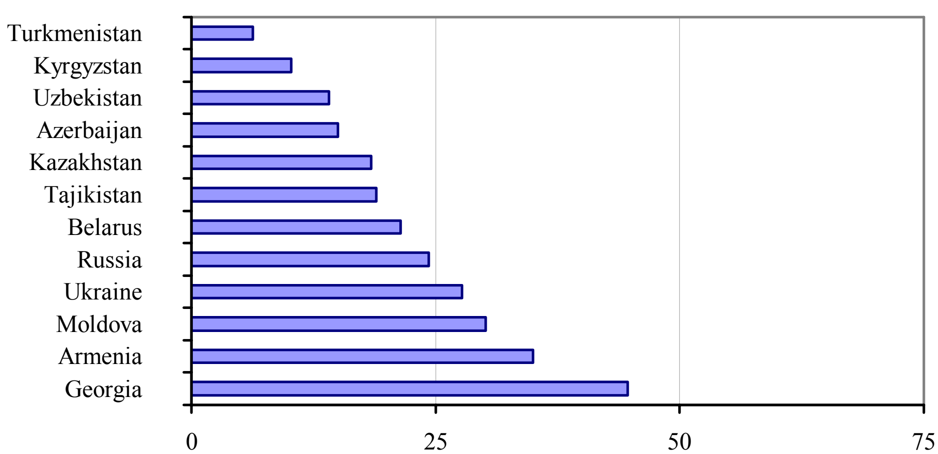
Source: Kaufmann, Kraay, and Mastruzzi, 2007.

Figure 4.2.5 Ranking of CIS countries in terms of voice and accountability (2006)



Source: Kaufmann, Kraay, and Mastruzzi, 2007.

Figure 4.2.6 Ranking of CIS countries in terms of control of corruption (2006)



Source: Kaufmann, Kraay, and Mastruzzi, 2007.

Cross-country comparisons in terms of progress in democracy are necessarily strongly simplified and any interpretation requires caution. We nevertheless provide results based on an Economist Intelligence Unit ranking of democracies (Economist, 2007). Among the CIS countries, geographical location appears to be a stronger determinant of the ranking with European countries (with the exception of Belarus) generally scoring better. The relative ranking of CIS energy-rich countries is broadly similar to the one provided e.g. by other governance indicators (Figures 4.2.5 - 4.2.6), with Russia faring somewhat better than other oil and gas economies, which record quite low scores.

Table 4.2.1 Ranking of CIS countries in terms Economist's democracy index (2007)

	Global rank	Overall score	Electoral process & pluralism	Functioning of government	Political participation	Political culture	Civil liberties
Ukraine	52	6.94	9.58	5.71	5.56	5.63	8.24
Moldova	62	6.50	9.17	4.29	6.11	5.00	7.94
Russia	102	5.02	7.00	3.21	5.56	3.75	5.59
Georgia	104	4.90	7.92	1.79	3.33	5.00	6.47
Armenia	110	4.15	4.33	3.21	3.89	3.13	6.18
Kyrgyzstan	111	4.08	5.75	1.86	2.78	5.00	5.00
Kazakhstan	120	3.62	2.67	2.14	3.33	4.38	5.59
Belarus	128	3.34	2.58	2.86	3.33	4.38	3.53
Azerbaijan	129	3.31	3.08	0.79	3.33	3.75	5.59
Tajikistan	149	2.45	1.83	0.79	2.22	6.25	1.18
Uzbekistan	160	1.85	0.08	0.79	2.78	5.00	0.59
Turkmenistan	162	1.83	0.00	0.79	2.78	5.00	0.59

Source: Economist (2007).

This brief account of the situation in the energy-rich CIS countries suggests the following general lessons. The oil price boom has helped in the economic revival of the last decade and during this period (which should be treated as quite specific, given the long-lasting transition decline in economic activities of the early 1990s) and one can hardly speak of the materialisation of any stronger negative effects from oil and gas wealth. The key question, and a difficult one, is on the potential long-term impact. Several potentially worrying signs are visible but there are also more encouraging signs. Broadly speaking, the development of democracy and civil society in energy-rich countries appears to be facing substantial problems, similar to most other CIS countries, where the situation (and trends) is far from satisfactory. On the other hand, the quality of governance, effectiveness of certain policies and progress in some economic reforms may appear stronger at least in Russia and Kazakhstan than elsewhere in the CIS.

Ahrend (2006) notes some positive developments in Russia with policies aimed at creating simple and transparent rules. This relates, among other things, to changes in fiscal federal relations and measures to curb bureaucratic interference in commercial activity. Tompson (2006) concentrates on Russia's political prospects. He argues that so far Russia has managed to resist many of the institutional and political pathologies commonly associated with resource-based development. This is not to say that political developments are particularly encouraging but rather that a resource-poor Russia would likely suffer from very similar problems. However, in Tompson's view, resource wealth does indeed pose a higher risk for the future political and institutional development. The current deficiencies of state institutions may prove costly if they result in ill-management of resource wealth.

The relevance of institutional development in CIS countries may be more important than in some other energy-rich countries. We claimed above that production of oil and gas can often be somewhat detached from other economic activities in any given country and that underdeveloped institutions may not hamper resource extraction too much. In the CIS context this may be less applicable because of the large distances to final energy markets and the landlocked location of the Caspian region (Uzbekistan is a "doubly landlocked" country as it only borders with landlocked countries, including Kazakhstan and Turkmenistan). This necessitates effective co-operation with neighbouring states to secure transit routes for energy resources, which in turn requires a certain institutional culture. The CIS record in this sphere is far from satisfactory (see discussion in Chapter 5).

Pomfret (2007) reports the results of an interesting investigation tracking the overall effects of Kazakhstani policies on agriculture – the key sector from the perspective of employment in the country and an important export sector. While data availability limits the strength of the conclusions it appears likely that after the period of policies discriminating against the agricultural sector up to the early 2000s, since 2003 the government has provided net support to the agriculture sector financed out oil money, which seems to be a reasonable policy. However, the difficulty in proper accounting of the various measures of support for / discrimination against the sector (as discussed in the paper) also demonstrates the difficulty in practical implementation of policies aimed at supporting the non-oil economy. In terms of potential policy recommendations this is really a key issue, which clearly requires a country-specific approach. It also confirms the importance of analytical backing of public policies in CIS countries, in particular in the countries dealing with natural resource booms.

Summing up, it is too early to say whether oil and gas will be a blessing or a curse for CIS countries. There is still large room for the decisions of respective countries as to the models of development they choose to follow. The international community (and the EU in particular) may play some role in this choice, although its impact is likely to be limited because countries enjoying high inflows of foreign currency are rarely interested in external policy advice.

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4.3 Dutch Disease in the Former Soviet Union: Witch-Hunting?

4.3.1 Introduction

As mentioned in the previous section, “Dutch Disease” may be an important channel for the detrimental influence of resource abundance on economic growth. In particular, Dutch Disease can contribute to deindustrialisation of a small open economy where the export of natural resources drives up the real exchange rate, making manufactured goods less competitive internationally.

This section combines the typical approaches used in the Dutch Disease literature (see chapter 2 and the previous section for a review) with a focus on CIS economies. We estimate the influence of changing commodity prices on the nominal and real exchange rate and subsequently analyse the extent to which endowment in natural resources influences long-term growth prospects in CIS countries. Our analysis elaborates on the link between exchange rate and long-term growth, an issue which merits an in-depth analysis. More generally, we test econometrically for the existence of the channels through which commodity prices are thought to be transmitted on the real economy.

4.3.2 Dutch Disease

In a country rich in natural resources increasing commodity prices can ignite a chain of events that may end up in a mighty commodity sector and a shrunken manufacturing sector. Higher commodity prices encourage more investment in the commodity sector and, consequently, attract more labour from the non-commodity sectors. Wages will also increase in the commodity sector owing to labour shortages that will lure labour from non-commodity sectors. Corden (1984) coins this phenomenon the *resource movement effect*, which results in direct deindustrialisation. Indirect deindustrialisation happens if the relative price of non-tradables relative that of tradables rises, which draws labour from the manufacturing sector into the non-tradable sector[26].

There are three theoretical reasons why the relative price of non-tradable goods may rise. The first is related to the resource movement effect: prices of non-tradables go up due to insufficient supply as result of a shift of labour resources from the non-tradable sector to the resource sector.

The second reason for an increase in prices of non-tradables is the increase in nominal and real wages in the commodity sector. If wages tend to equalise across sectors, this will lead to higher wages in other sectors of the economy. As a consequence of wage increases in the non-tradable sector, the relative price of non-tradable goods will increase.

Thirdly, an increase in relative prices of non-tradables is caused by demand factors, i.e. higher profits and wages in the commodity sector and the related tax revenues, which are spent on non-tradable goods and services (the *spending effect*).

Table 4.3.1 Symptoms of a commodity boom

STAGE

26 For the sake of simplicity of the discussion we follow the classical terminology, where the manufacturing sector and tradable sector are treated as synonyms.

1. Rise in commodity prices
2. Increase in investment in the commodity sector
3. Resource movement effect
- changes in real wages in the commodity sector
- increase (decrease) in employment in commodity (manufacturing, services) sectors
4. Changes in the relative price of non-tradables
- Resource movement effect
- wage equalisation: changes in nominal wages in other sectors led by wage increases in a commodity sector
- spending effect
- Balassa-Samuelson effect
5. Real exchange rate (RER) effects 5.a. Due to the relative price of non-tradables – RER based on the CPI 5.b. Due to the relative price of tradables – RER based on the PPI 5c. Due to a nominal appreciation
6. Output and employment declines in manufacturing

One consequence of the rise in the relative prices of non-tradable goods and services due to wage spill-over from the commodity sector is the appreciation of real exchange rate. This increase in the relative price of non-tradables can overlap with the traditional Balassa-Samuelson effect due to productivity gains in the non-oil manufacturing sector[27]. If there is proportional wage equalisation across sectors and if increases in wages feed into non-tradable prices in a one-to-one fashion, the commodity boom will dominate the Balassa-Samuelson effect on condition that wage increases originating from a commodity sector are higher than that in the manufacturing sector stemming from growing productivity. This appreciation – irrespective of whether it comes from the commodity sector or from the Balassa-Samuelson effect - can be regarded as harmless until the real exchange rate of the manufacturing sector (or a tradable sector) remains untouched.

Nonetheless, the real exchange rate of the manufacturing sector will appreciate if higher wages and prices are generated by the wage equalisation process from the commodity sector. The effect of wages on prices may be dampened by productivity gains in the manufacturing sector (Balassa-Samuelson effect). In addition, appreciation of the real exchange rate of the manufacturing sector can be caused by appreciation of the nominal exchange rate due to the inflow of foreign capital, a spin-off from the investment boom in the commodity sector.

As a consequence of appreciation, the manufacturing sector loses its competitiveness, manifested in a decline in output and employment, leading to deindustrialisation (Égert and Leonard, 2007). Table 4.3.1 summarises the symptoms of a commodity sector boom that crowds out the manufacturing sector.

27 The Balassa-Samuelson effect arises when the productivity of the traded-goods sector exceeds that of the non-tradable sector. In such a case, productivity gains in the tradable sector lead to higher real wages in the non-tradable sector without harming competitiveness provided relative PPP holds for the sector, that is, if the real exchange rate is stable over time. If wages equalise between the tradable and market-based non-tradable sectors, prices in the latter will rise and that will be reflected in higher overall inflation and eventually in real appreciation.

Implications of Dutch Disease for growth

As a consequence of nominal and real appreciation driven by commodity prices, the non-commodity manufacturing sector loses its competitiveness, which is manifested in a decline in output and employment. It is precisely the disappearance of the non-oil manufacturing sector that creates the boom and bust cycle, because during the collapse of commodity prices there is no non-commodity manufacturing capacity to step in to compensate for the decline in commodity-production. Hence, commodity price fluctuations are strongly reflected in fluctuations in overall economic activity. This is what we could refer to as active or long-term Dutch Disease: economic growth is damaged in the long-term because non-commodity manufacturing is hollowed out.

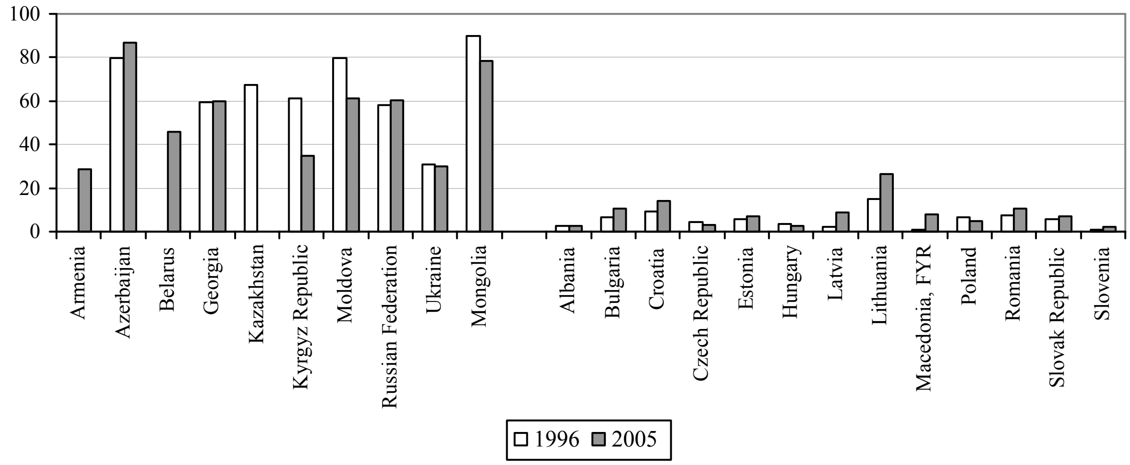
In the short-term, even if non-oil manufacturing activity is maintained, economic fluctuations may remain strong due to commodity price fluctuations simply because of swings in commodity-related activities. The lower the share of the commodity-producing sector in GDP, the lower overall economic fluctuations would be due to short-term or passive Dutch Disease.

Stylised facts

It is interesting to look into the issue of Dutch Disease because oil prices have recorded a large increase over the last 10 years or so – from slightly above USD 10 per barrel in 1998 to above USD 100 a barrel in early 2008. This sharp increase may have given rise to Dutch Disease in economies that rely heavily on oil extraction and processing. Several CIS countries may especially qualify as "commodity economies". As discussed in section 3.4.2, in 2005 energy commodities accounted to over 60% of merchandise exports in Turkmenistan, Azerbaijan, Kazakhstan and Russia and over 30% in Belarus. This contrasts with the considerably lower levels of commodity exports in total exports in other transition economies. In Central and Eastern Europe, the Baltic countries and South Eastern Europe, commodities accounted for between 10% (Czech Republic) and 40% (Latvia and Lithuania) of total exports in the same year (Figure 4.3.1).

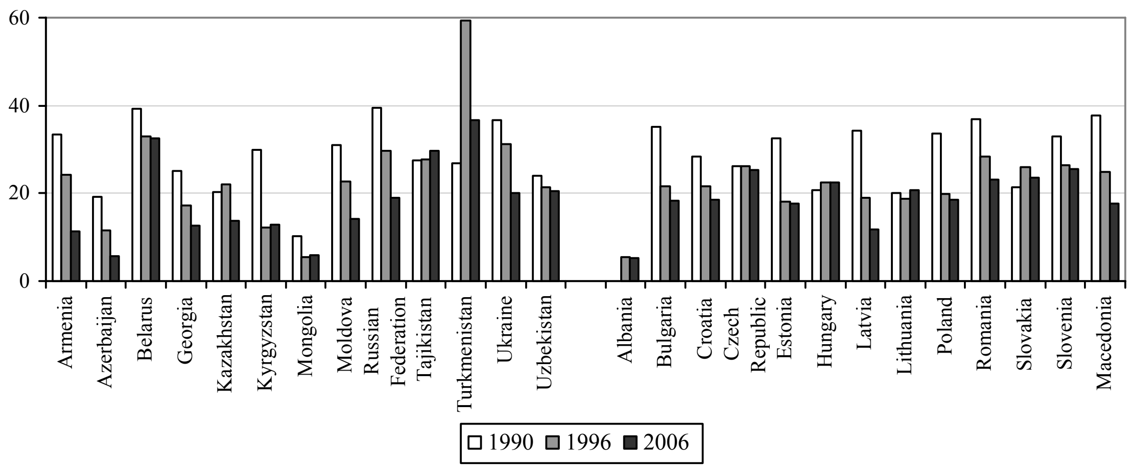
A first indication of possible Dutch Disease is the change in the composition of nominal GDP. Data plotted in Figure 4.3.2 shows that the share of the manufacturing sector in total GDP declined systematically between 1990 and 2005, while mining gained more importance over the same period, in CIS countries. Three observations cane be made here. Firstly, the share of manufacturing also fell in non-CIS transition economies, probably largely due to the correction of earlier over-industrialisation. Manufacturing fell mostly in countries where manufacturing accounted for more than 30% of total GDP, and it remained stable in countries where it was lower (Czech Republic, Hungary, Lithuania and Slovakia). Secondly, the share of manufacturing was not strikingly lower in some of the CIS countries than in the comparator group of non-CIS transition economies. However, in Armenia, Azerbaijan, Georgia, Kazakhstan, and Kyrgyzstan, the share of manufacturing decreased to around or even below 10% of GDP. Of these countries, Azerbaijan and Kazakhstan are among the most important fuel exporters. Finally, we can see from data depicted in Figure 4.3.2 that in 2005 the share of mining in GDP amounted to more than 10% in some of the CIS countries like Azerbaijan, Kazakhstan, and Uzbekistan. By contrast, mining lost importance dramatically in virtually all non-CIS countries (with the exception of Lithuania and Romania).

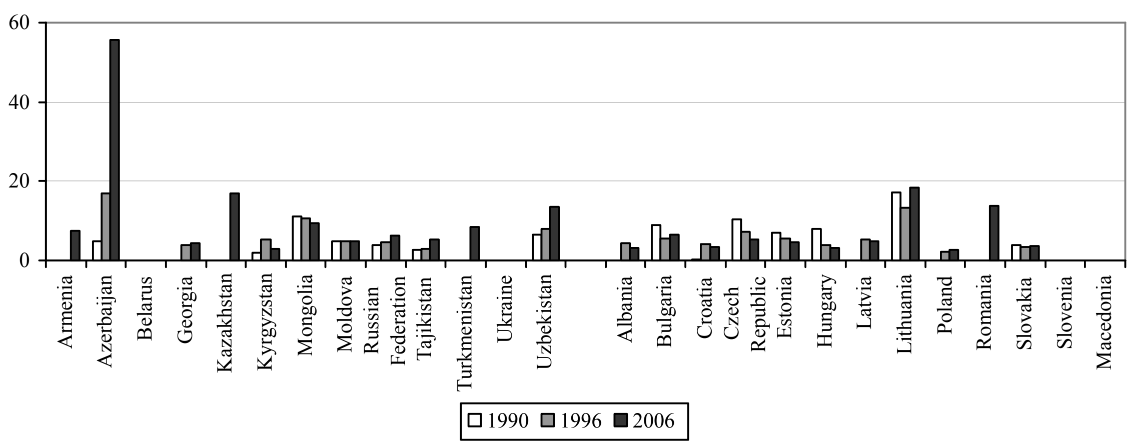
Figure 4.3.1 The share of all commodities in total exports, 1996 and 2005 (%)



Source: Author's calculations based on World Development Indicators data.

Figure 4.3.2. Manufacturing (top) and mining (bottom) as a share of GDP in current prices, 1990-2006





Source: Author's calculations based on World Development Indicators data.

We would have liked to look into the issue of a possible shift of labour into the mining sector in the aftermath of oil price increases. However, the lack of data with regard to sectoral employment that would allow us to distinguish between mining and manufacturing posed a constraint on our analysis. Consequently, we are not able to see the extent to which the rise of commodity prices resulted in a sectoral reallocation of labour to mining industry from the rest of the economy. However, we discuss here the results of the three recent studies looking at the more disaggregated data (for Russia and Kazakhstan) that were available to us.

Ahrend, de Rosa and Tompson (2007) investigated productivity, wage and output developments in Russia's non-oil manufacturing sectors. By analysing the period from 1995 to 2003/2004, they took Ukraine as the benchmark of how Russia would have developed without relying on its energy resources. The authors show that wages were higher in Russian manufacturing than in Ukraine. They argue that rouble appreciation certainly contributed to lower non-oil manufacturing output in Russia as compared to Ukraine and that some sectors may have become uncompetitive. Nevertheless, they also claim that these developments did not result in a hollowing out of the manufacturing sector. Furthermore, they conclude that a higher living standard in Russia as compared to Ukraine is certainly due to energy production.

Ollus and Barisitz (2007) analysed the final stage of Dutch Disease, namely the deindustrialisation of non-energy manufacturing in Russia. They compared the growth rate of imports to that of domestic production growth for 13 non-oil manufacturing sectors. They argue that imports growing much faster than domestic growth can be considered a sign of a slide in competitiveness and of Dutch Disease. They nevertheless acknowledge that strong import growth may have been caused by something other than Dutch Disease. For instance, high import growth rates, coupled with low import penetration rates, are not a matter of concern. Similarly, imports are not always substitutes for domestic production. Looking at the period between 2002 and 2006, they find strong import growth rates in a number of sectors such as leather, leather products and shoes, textiles and textile products, machinery and equipment, and electrical, electronic and optical equipment. They also show that trends are worrying in other sectors as well. The two sectors not much influenced are mining and quarrying and food production. The authors argue that the high level of tariffs explains the good "performance" of food production.

Égert and Leonard (2007) report less worrying results for Kazakhstan. They use highly disaggregated data to trace back the transmission chains of Dutch Disease. For the period 1998 to 2005 they do not find any robust evidence that oil price increases substantially affected investment and wages in non-oil manufacturing and relative prices in the economy. Their figures suggest that productivity gains in manufacturing largely compensated for wage increases over the period studied. Furthermore, they observe little spillover from oil prices to the non-oil price of the producer price index. Finally, they show that over the same period, the real exchange rate of the non-oil tradable sector does not appreciate as a result of oil price increases.

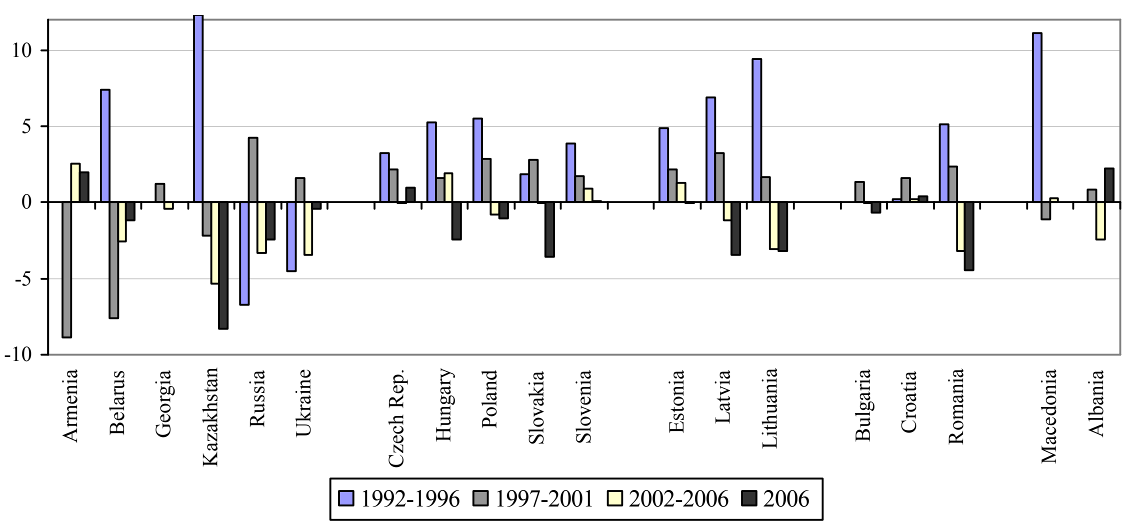
The next chance to catch a glimpse of the elusive Dutch Disease is presented by a study into the impact of resource movement and spending effects on relative prices of non-tradable goods to those of tradable goods. We used two broad measures of relative prices: the ratio of overall CPI to food prices (as a proxy for goods prices) and the ratio of overall CPI to the wholesale price index. While these measures are of course not perfect (see e.g. Égert, Lommatzsch and Lahrèche-Révil, 2006), they allow a comparison of the broad developments in a relatively large number of countries.

Figure 4.3.3 plots average changes in the CPI to PPI ratio and finds evidence that relative prices declined substantially in the CIS countries for which data are available after 1997.[28] Relative prices increased or declined much less in non-CIS countries during the same period. The annual data series plotted in Appendix 3 confirms the same story, implying that it is hard to identify – at least when applying eyeball econometrics – any correlation between oil prices and the relative price of non-tradable goods and casting doubt on the functioning of the resource movement and spending effects.

Let us now turn to the real exchange rate. As figure 4.3.4 shows, while the real exchange rate calculated on the basis of the CPI and vis-à-vis the US dollar appreciated to some extent during the post-1998 currency crisis period, this appreciation is apparently partly a correction in the large depreciation during and in the aftermath of the crisis. Furthermore, the extent of this appreciation has nothing to do with the sizeable appreciation that occurred during the run-up to the Russian and other CIS 1998-1999 crises. Perhaps with the exception of Azerbaijan, the real exchange rate of the CIS countries has appreciated only modestly since 2001.

Finally, coming to real GDP growth, Figure 4.3.5 shows that CIS countries recorded a much sharper drop in real GDP during the early stage of economic transition, but then exhibited considerably stronger economic growth than their non-CIS counterparts, except the three Baltic countries.

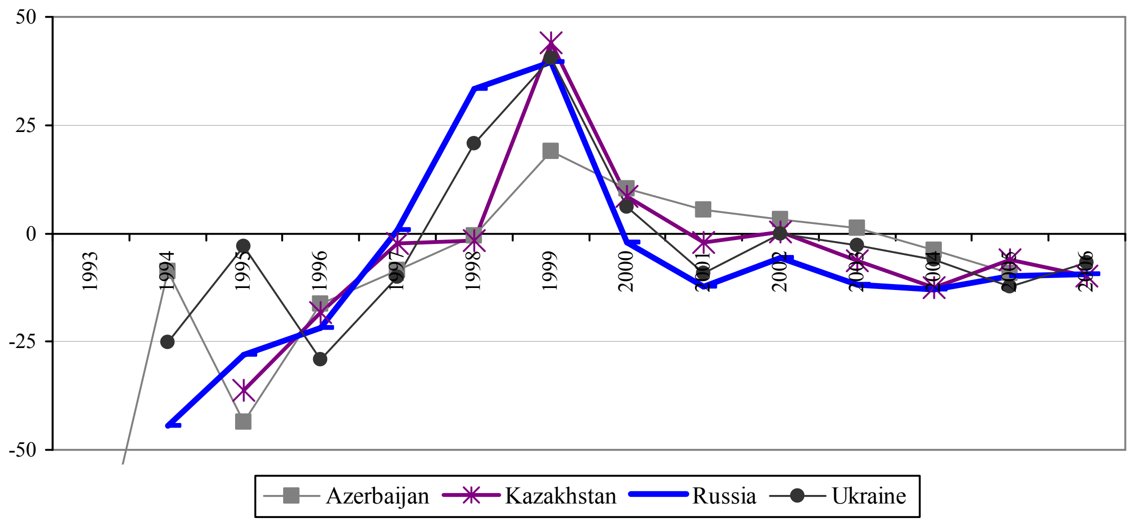
Figure 4.3.3 Changes in relative price of non-tradables, 1990-2006 (%)

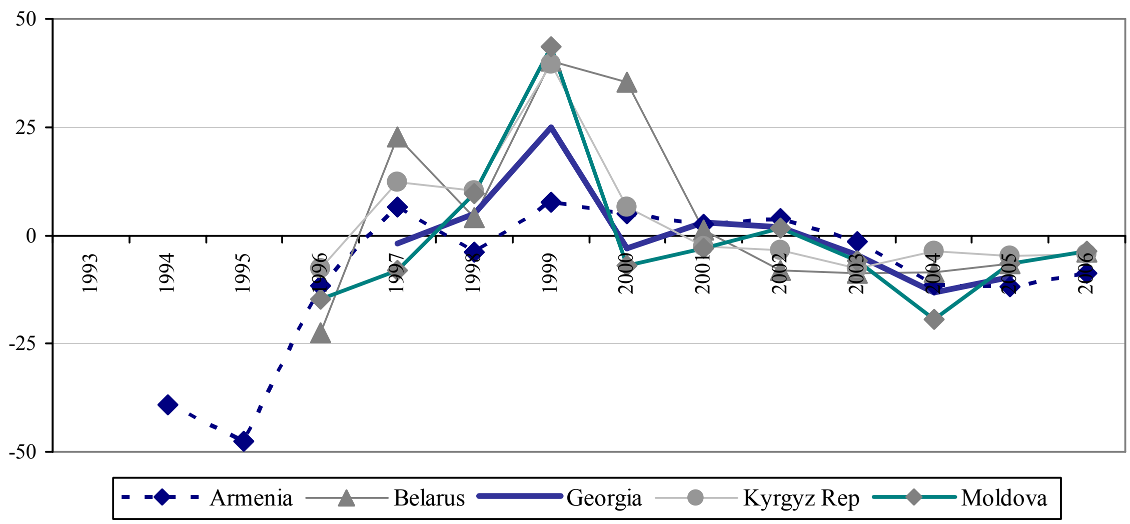


Source: Author's calculations based on data obtained from the World Development Indicators database. The relative price is measured as the CPI to PPI ratio.

28 The data are drawn from the World Bank Indicators database.

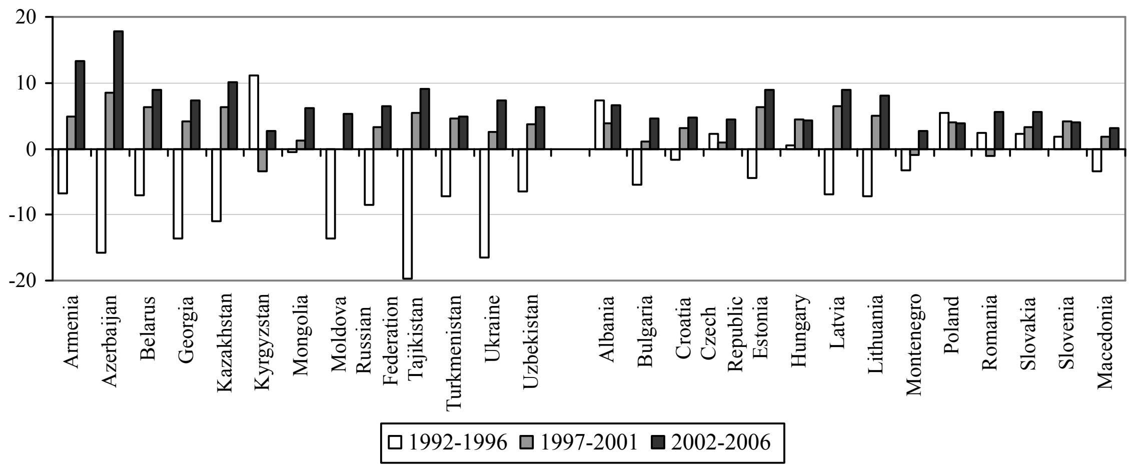
Figure 4.3.4 The (CPI-based) real exchange rate vis-à-vis the dollar, 1993-2006, annual changes





Source: Author's calculations based on data obtained from the World Development Indicators database.

Figure 4.3.5 Real GDP growth, 1992-2006



Source: Author's calculations based on data obtained from the World Development Indicators database.

4.3.3 Empirical Tests for Dutch Disease

There are two obvious ways to test empirically for the existence of Dutch Disease. The first avenue relates to the link between developments in nominal and real exchange rates originating from oil prices. The second way is to look at the growth effects of resource abundance and oil prices. We briefly elaborate on these two possibilities in this section with technical details delegated to Appendix 3.

Commodity Prices and the Exchange Rate

The literature provides two straightforward ways to get a grasp the effect of commodity prices on exchange rates. Firstly, commodity prices can be incorporated into a standard monetary model of an exchange rate. Secondly, real commodity prices are a commonly used indicator of terms of trade shocks and are used in real exchange rate models. Let us review briefly how exactly commodity prices can be considered in these two approaches.

The Monetary Model and Commodity Prices

The standard monetary model relies on a two-country framework in which each country produces one (tradable) good, has its own money and bonds that are perfectly substitutable. Standard money demand functions for the domestic and foreign economies are the first building block of the model that, combined with the assumptions of purchasing power parity (PPP) holding for the whole economy ($e_t = p_t - p_t^*$) and on demand equalling supply on the money market ($m_t^D = m_t^S, m_t^{D*} = m_t^{S*}$), helps us express the nominal exchange rate as a function of money supply, income and interest differential across the home and foreign economies:

$$e_t = m_t - m_t^* - \beta_1(y_t - y_t^*) + \beta_2(i_t - i_t^*) \tag{1}$$

where e_t is the nominal exchange rate, expressed as units of domestic currency per one unit of foreign currency[29], m_t and y_t are money supply and real income and i_t denotes the interest rate.

The standard monetary model can be tailored to capture the features of commodity exporting countries. Details are presented in the Appendix 3. The modified exchange rate equation can be given by (2):

$$e_t = m_t - m_t^* - \beta_1(y_t - y_t^*) + \beta_2(i_t - i_t^*) - \beta_4 trend \qquad (2)$$

where the term 'trends' captures the trend appreciation of tradable sector's real exchange rate due to a quality effect (see e.g. Égert, Halpern and MacDonald, 2006).

The Real Exchange Rate and Commodity Prices

The risk adjusted real interest parity relationship, which has been used extensively in the literature (see e.g. Faruqee, 1995; MacDonald, 1998a,b) provides a convenient general framework for modelling the relationship between the real exchange rate and economic fundamentals. The real interest parity condition states that the real exchange rate expected one period ahead is a function of the expected real interest rate and a time-varying risk premium. If the expected real exchange rate is the outcome of the expected values of economic fundamentals, the observed real exchange rate is determined by the vector of long-term fundamentals, assuming rational expectations.

Real commodity prices are commonly included in real exchange rate models to capture terms of trade fluctuations. In net commodity exporting countries, an increase in commodity prices related to the price of other (imported) goods represents a positive terms of trade shock and thus leads to real appreciation, while opposite effects affect net commodity importers.

Of the many other potential fundamentals, the productivity variable is by far the most robust in empirical work. Productivity affects the real exchange rate via two channels. The first is related to the Balassa-Samuelson effect and transits through the relative price of non-tradables to that of tradables. The second channel concerns the real exchange rate of the tradable sector. According to New Open Economy Macroeconomics (NOEM) models, productivity gains in the tradable sector cause the real exchange rate of that sector to depreciate through the terms of trade channel (see e.g. MacDonald and Ricci, 2002 and Benigno and Thoenissen, 2003). Whether or not the real exchange rate of the whole economy depreciates or appreciates in the aftermath of an increase in productivity of the tradable sector depends on whether depreciation of the open sector's real exchange rate is outweighed by the real appreciation induced by the Balassa-Samuelson effect.

By contrast, productivity gains in tradables can cause a real appreciation of the tradable sector's exchange rate due to a quality effect that occurs both on the production and consumption side. On the one hand, the catching-up process entails production of goods and services of improved quality. On the other hand, private households grow richer and upgrade the quality of their consumption basket, which can be viewed as an extension of Engel's law. To the extent that these changes take place rapidly, statistical offices may find it difficult to filter out all quality effects from the inflation rates. As a result, quality effects will show up in inflation rates to a varying

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29 This implies that an increase (decrease) in the exchange rate is a depreciation (appreciation) of the domestic currency vis-à-vis the foreign currency.

extent (Égert, Lommatzsch and Lahrèche, 2006 and for a formal modelling Bruha and Podpiera, 2007). Égert, Lommatzsch and Lahrèche (2006) provide ample empirical evidence on how differently productivity gains impact on the real exchange rate of mature OECD economies and catching-up transition economies.

It has been argued recently that remittances may play an important role in real exchange rate movements in developing countries. Lopez, Molina and Bussolo (2007) argue that workers' remittances can have an influence on the exchange rate because they are reflected in capital inflows. They identify three channels through which remittances may impact on the exchange rate: via net foreign assets effects, via demand effects on services if remittances are spent on consumption rather than on investment and via economic growth. Our sample includes a number of countries where remittances are fairly high (see Figure 3.6 in Section 3.5.3). It is against this background that we also use remittances as an explanatory variable.

Testable equations

We estimate three variants of the monetary model that we sketched out above:

- The standard monetary model augmented with commodity prices
- The Balassa-Samuelson monetary model augmented with commodity prices
- The monetary model augmented with a trend and commodity prices

We do not include the interest rate variable in the monetary model because its potential impact is blocked by capital controls in a number of countries, especially in the CIS.

For the real exchange rate, we estimate a model for the CPI-based real exchange rate that includes GDP per capita vis-à-vis the foreign benchmark and real commodity prices. The choice of the per capita income variable is motivated by the fact that sectoral productivity figures that allow for the separation of commodity and non-commodity productivity are not available for our set of countries. It needs to be emphasised that the per capita income variable not only captures the Balasssa-Samuelson effect but is also a proxy for the factors driving the appreciation of the tradable sector's real exchange rate. Furthermore, this variable can also reflect demand side effects. Finally, remittances as a share of GDP will be also used in the estimations. As result, the following reduced-form equations will be estimated for the real exchange rate:

- Real exchange rate, GDP per capita and real oil prices
- Real exchange rate, remittances and real oil prices
- Real exchange rate, GDP per capita, remittances and real oil prices

Estimation results

We first use standard panel unit root tests to analyse the time series properties of our data.[30] The Levin-Lin-Chu (LLC) test – that imposes a homogenous mean reversion on the sample – and the Im-Pesaran-Shin (IPS) test – that allows for country specific mean reversion – suggest that most of the series used in the nominal and real exchange rate models are stationary. Among others, the nominal and real exchange rate series also turn out to be stationary in levels. By contrast, both

30 The following data series are calculated as the ratio of the domestic variable to the foreign benchmark (USA or euro area): monetary aggregates, real GDP growth and GDP per capita (in PPS).

tests indicate that the nominal and real oil price series have a unit root both for the CIS panel and the non-CIS panel. Additionally, there is mixed evidence for some of the other explanatory variables, such as GDP per capita, real GDP and monetary aggregates. This leads us to use (log) differences series because differencing the data transforms the independent variable of interest (oil prices) into stationary series. This is how we can obtain economically meaningful coefficients by regressing changes in the exchange rate on changes in the price of oil.

Tables 4.3.2 and 4.3.3 report estimation results obtained for the dollar and euro exchange rates. We carried out the estimation for the whole period running from 1991 to 2006. Because there is an obvious break in the exchange rate series of the CIS countries around the 1998-1999 crisis (see Figure 4.3.4), we split the sample in two sub-samples. Only results obtained for the sub-period from 1999 to 2006 are reported in Tables 4.3.2 and 4.3.3 as the results for the whole period and the first sub-samples do not seem to provide us with additional information regarding exchange rate movements in the CIS countries.

We first carried out a simple bivariate regression between the nominal exchange rate and nominal oil prices on the one hand, and then on the real exchange rate and the real price of oil (deflated by US CPI) – for results see tables A4.3.2 and A4.3.3 in Appendix 3. The striking finding is that there seems to be no statistical relationship between changes in the exchange rate and changes in oil prices. The fixed effect OLS estimations for the monetary model and variants of the real exchange rate model do not alter this conclusion.

Table 4.3.2 Estimation results from a monetary model

	Vis-à-vis the US dollar					vis-à-vis the euro				
	CIS-10 – 1999-2006 – lagged oil prices									
OIL_NOM	-0.183		-0.202	-0.280	0.320	-0.360*		-0.543***	-0.592***	-0.393*
OIL_NOM(-1)	-0.398***		-0.304***	-0.278***	-0.127	-0.485***		-0.450***	-0.456***	-0.401***
OIL_NOM(-2)	-0.343**		-0.217	-0.233	0.211	-0.367***		-0.350***	-0.369***	-0.230
REAL_GDP			-1.140**	-0.690	-0.134			-0.041	0.386	0.239
M2			0.649***	0.693***	0.666***			0.658***	0.679***	0.649***
CAPITA				-1.115					-0.808	
TREND					-0.067***					-0.019
R^2 adj	0.35		0.47	0.47	0.60	0.48		0.59	0.59	0.59
No. of country	10		10	10	10	10		10	10	10
OBS	80		80	80	80	80		80	80	80

Notes: *,** and *** indicate statistical significance at the 10, 5 and 1 percent levels.

Table 4.3.3 Estimation results from real exchange rate models

	Vis-à-vis the US dollar				vis-à-vis the euro			
	CIS-10 – 1999- 2006 lagged real oil prices							
OIL_REAL	-0.143	-0.193*	-0.113	-0.170	-0.333***	-0.329***	-0.364***	-0.359***
OIL_REAL(-1)	-0.256***	-0.205***	-0.245***	-0.203***	-0.350***	-0.355***	-0.359***	-0.361***
OIL_REAL(-2)	-0.192***	-0.177**	-0.158**	-0.157**	-0.212***	-0.216***	-0.239***	-0.239***
CAPITA		-1.187***		-1.060**		0.230		0.130
REMITTANCES			-0.042**	-0.031			0.020	0.018
R^2 adj	0.32	0.39	0.35	0.41	0.65	0.65	0.65	0.65
No. of country	10	10	10	10	10	10	10	10
OBS	77	77	76	76	77	77	76	76

Notes: *,** and *** indicate statistical significance at the 10, 5 and 1 percent levels.

The lack of a statistical relationship between oil prices and the exchange rate may be for several reasons. Firstly, our period might be too short to detect such a relationship. Secondly, individual countries might be affected differently, and those that are influenced less by oil prices dominated the ones for which oil prices would matter for exchange rate movements. Finally, the oil price may feed into an appreciation with some lag. We check this latter possibility by employing lagged nominal and real oil prices. The bivariate relationships suggest that changes in the nominal oil price show its influence on the nominal exchange rate of CIS countries against the dollar with a lag of one and two years. For the euro exchange rates, even the contemporaneous coefficient becomes significant. Nevertheless, once we account for the determinants of the monetary model, only the nominal oil price lagged with one year remains statistically significant for the dollar exchange rate. Somewhat surprisingly, the effects of oil prices stay largely unchanged by the inclusion of the monetary variables.

We observe a similar pattern for real oil prices and the real exchange rate: the real price of oil induces a real appreciation with a lag of one and two years. The inclusion of the other control variables does not change the results.[31]

4.3.4 Natural Resources and Economic Growth

The next question relates to the impact of resource abundance and commodity prices on economic growth. We argue earlier that commodity prices could correlate positively on economic growth in

31 Regarding the monetary model, its standard version appears to produce the expected results for the CIS countries against the US dollar and for the non-CIS countries against the US dollar and euro: relative real GDP growth causes nominal exchange rate appreciation while relative money supply generates a currency depreciation. Relative GDP per capita and the time trend also lead to nominal appreciation. This result is less robust, partly because the issue of multi-collinearity may arise between the relative GDP per capita and relative real GDP variables. The adjusted R-square of the monetary model suggests that around half of the variation in the nominal exchange rate can be explained by the explanatory variables.

Turning now to the real exchange rate models, it is worth noting that relative GDP per capita growth and remittances are associated with an appreciation of the dollar real exchange rate of CIS countries. For the euro exchange rate, none of the variables are statistically significant. Interestingly, and contrary to earlier findings of the literature, the real exchange rate models perform pretty badly for non-CIS countries.

the short-term (passive Dutch Disease) and that the presence of important natural resources may impede economic growth in the longer run (active Dutch Disease).

To provide an answer to these two questions, we estimate growth equations for the countries of the former Soviet bloc to see the extent to which the reliance on natural resources influences long-term economic growth. We use a number of proxies to study this issue:

- the share of fuel exports in total exports (X_OIL)
- the share of natural resources (fuel, metal, agricultural products and food) in total exports (X_NATRES)
- The share of the mining industry in total GDP (MINING)

We incorporate the usual control variables employed in the growth literature. While there seems to be no consensus on what the usual determinants of long-term growth are (see e.g. Durlauf et al., 2004 and Barro and Sala-i-Martin, 2004), we employ the **main factors** usually viewed as driving economic growth in our benchmark specification:

- investment to GDP ratio (INV)
- government consumption to GDP ratio (GOVC)
- labour force growth (LABFOR)
- openness (exports + imports of goods and services as per cent of GDP, OPEN)
- human capita captured by educational attainment: total upper secondary education enrolment (EDU1), higher education enrolments (gross ratios, per cent of population aged 19-24) (EDU2) and public expenditure on education (per cent GDP) (EDU3)
- health of the population in 1990 measured by public sector expenditure on health (per cent of GDP) (HEALTH1) and the incidence of tuberculosis (as new cases per 100000 population) (HEALTH2)

In transition economies, **initial conditions** are particularly important, especially during the early days of the transition process. We use the following variables for initial conditions that could have an impact on growth:

- initial conditions. level of GDP per capita in 1990 (CAPITA90)
- human capital in 1992: total upper secondary education enrolment in 1992 (EDU1_92) and higher education enrolments in 1992 (EDU_92)
- the health of the population in 1990 measured by the incidence of tuberculosis (HEALTH2_90)
- foreign debt as a share of GDP in 1993 (FDEBT_93)

It should be noted that initial conditions can be used as constant terms given that they take the same value over time. As a result, only one of them can be included at a time.

Furthermore, we include another set of variables viewed as **crucial for transition and developing economies**:

- inflation as a measure of macroeconomic stability (INF)
- corruption measured by the following indicators: the Corruption Perception Index of the Transparency International (CORR_TI) in 1999 and the corruption index published by the

World Bank for 2002 (% of managers surveyed ranking this as a major constraint) (CORR_WB)

- additionally, we interact corruption with natural resources
- structural indicators reflecting reforms implemented in the corporate and banking sectors (INSTIT)
- remittances as a share of GDP (REMIT)

We take a long-term perspective and perform cross-sectional regressions using 5-year and 8-year averages of the dependent and independent variables. We have at best 3 observations for each country when 5-year averages are used (1992-1996, 1997-2001, 2002-2006) and two observations for 8-year averages (1991-1998, 1999-2006).

While the growth literature usually suggests a regression in the growth rate of GDP per capita in PPP in the above listed set of variables, we also use real GDP growth rates, an indicator of utmost policy interest.

Table A4.3.4 in Appendix 3 reports the results of the bivariate relationship between real GDP growth (and alternatively the growth rate of per capita income in purchasing power standards – PPS) and the three measures capturing natural resource abundance. The size of oil exports in total exports and the relative size of the mining industry turn out to be correlated positively with growth. The relationship is, however, not significant if the share of all primary goods (oil, metal, agricultural products and foodstuff) in total exports is considered. This suggests that positive growth effects are due to flourishing oil exports and the mining industry but not to other, mainly agricultural, sectors.

The question that arises is whether the relation between oil production and exports increased over time, in particular with the observed increase in crude oil prices over the last 10 years or so. To answer this question, we interacted the three measures at hand with a time trend. The results show that the effect of natural resources on economic growth increased over time, irrespective of whether we use 5-year or 8-year averages.

As a next step, we added a set of control variables to the growth equation estimated with fixed effect OLS. Table 4.3.4 reports the results for GDP per capita growth that shed new light on the relation between oil exports and growth. We establish a negative relation between oil exports and growth. Nonetheless, oil exports interacted with time trend are found to increase long-term growth. Our interpretation of these results is that during the first stage of transition, the reliance on oil production does not help economic growth but starts to contribute to growth from the mid-1990s. This is fairly intuitive if we think of the very large decline of GDP in the major oil producing transition economies during the first half of the 1990s and the very strong growth these countries have experienced since then compared to the non-oil producing transition economies.

It is noteworthy that high inflation rates reduce long-term growth, whereas an increase in labour force and higher remittances increase growth for our set of countries. The other controls remain statistically insignificant.

Finally, we used the two measures of corruption (for which we have only one observation per country) and a number of variables aimed at controlling for initial conditions. Because these variables act as country fixed effects, we carried out pooled OLS including a constant term (see Table 4.3.5 and Table A4.3.5 in Appendix 3). Our previous findings seem to be very robust to the inclusion of initial conditions. In fact, initial conditions and the degree of corruption are unimportant for economic growth at least for our country sample.

Table 4.3.4 Growth equations – all transition economies

	GROWTH RATE OF GDP PER CAPITA (PPP, USD)					
	5-YEAR AVERAGES 1992-2006			8-YEAR AVERAGES 1991-2006		
X_OIL	**-0.463****	**-0.426****	**-0.435****	**-0.509****	**-0.481****	**-0.442***
X_OIL*@TREND	**0.137*****	**0.135*****	**0.123*****	**0.269*****	**0.269*****	**0.253****
CPI	-0.011***	-0.011***	-0.011***	-0.010***	-0.010***	-0.009**
OPEN	-0.033	-0.033	-0.055	0.061	0.071	0.069
GOVC	0.192	0.217	0.169	0.106	0.376	0.207
INV	-0.097	-0.074	-0.084	0.220	0.240	0.197
INSTIT	2.754	2.197	4.999**	-0.635	-0.116	2.924
LABFOR	1.739**	1.594**	1.361*	0.077	0.131	0.140
REMIT	0.650***	0.659***	0.611***	0.698**	0.675**	0.679*
EDU1	0.057			0.222		
EDU2		0.054			0.087	
EDU3			-0.772			0.661
HEALTH2	0.070	0.060	0.053	0.126**	0.086*	0.093
R^2	0.90	0.90	0.91	0.96	0.96	0.95
R^2 adj	0.80	0.80	0.81	0.83	0.84	0.81
No. of countries	22	22	22	22	22	22
OBS	63	63	61	44	44	43

Note: *, ** and *** indicate statistical significance at the 10, 5 and 1% levels.

Table 4.3.5 Growth equations – initial conditions, 8-year averages – all transition economies

	GROWTH RATE OF GDP PER CAPITA (PPP, USD)						
X_OIL	**-0.097***	**-0.100***	**-0.104***	**-0.100***	**-0.107***	**-0.104***	**-0.115****
X_OIL*@trend	**0.262*****	**0.263*****	**0.266*****	**0.259*****	**0.262*****	**0.263*****	**0.262*****
CPI	-0.003	-0.003	-0.003	-0.003	-0.004	-0.003	-0.004
OPEN	0.011	0.013	0.012	0.009	0.014	0.013	0.004
GOVC	-0.200	-0.220	-0.193	-0.208	-0.239	-0.227	-0.200
INV	0.216*	0.218*	0.209*	0.203*	0.215*	0.211*	0.216*
INSTIT	1.539	1.361	1.388	1.432	1.559	1.440	1.378
LABFOR	-0.247	-0.180	-0.185	-0.101	-0.239	-0.203	-0.115
REMIT	0.394**	0.421**	0.418**	0.410**	0.413**	0.410**	0.443**
EDU1	0.157*	0.150*	0.149*	0.150*	0.104	0.153*	0.121
HEALTH2	0.016	0.021	0.017	0.026	0.017	0.017	0.021
CORR_TI?						-0.180	
CORR_WB?							0.663
	INITIAL CONDITIONS						
LOG(CAPITA90)	-0.818						
FDEBT_93		0.006					
HEALTH1_92			-0.112				

HEALTH2_92				-0.027			
EDU1_92					0.067		
R^2	0.78	0.77	0.77	0.78	0.78	0.77	0.78
R^2 adj	0.69	0.68	0.69	0.69	0.69	0.69	0.70
No. of countries	22	21	22	22	22	22	22
OBS	44	42	44	44	44	44	44

Note: *, ** and *** indicate statistical significance at the 10, 5 and 1% levels. Table with results for 5-year averages can be found in Appendix 3 (Table A4.3.5).

4.3.5 Concluding Remarks

In this study, we sought to uncover the extent to which countries of the former Soviet Union are suffering from Dutch Disease. The stylised facts showed that some of the CIS countries are very dependent on the production and export of primary goods, in particular oil and gas (see chapter 3 for more details). Despite the importance of oil production, we could not establish the presence of resource and spending effects because the relative prices of the CIS countries has declined in recent years instead of the expected rise arising from Dutch Disease. Nevertheless, the share of manufacturing declined and the importance of the mining sector increased recently, coupled with a surge of real economic growth.

These are first indications that an increase in the price of oil has an influence on the real economy of the CIS countries. Our analysis revealed that an increase in oil prices results in an appreciation of the nominal and real exchange rates both against the dollar and the euro: the pass-through from oil prices to the exchange rate does take some time to materialise. We found that oil price increases feed into nominal and real appreciation with a delay of one and two years.

Finally, we addressed the question of whether relying excessively on natural resources impedes long-term growth or whether it helps increase GDP. Our results based on growth regressions using 5-year and 8-year averages indicate that oil exports are linked positively with economic growth. Nevertheless, a high share of other primary goods - mainly agricultural products - in total exports does not seem to promote growth. Our results also showed that oil exports did have a negative effect on growth during the first stage of economic transition but that they have started to contribute positively to it over the last years.

While data problems prevented us seeing whether there is a reallocation of labour between sectors due to high oil prices, our results with regard to the exchange rate and the sources of economic growth are a sign of Dutch Disease: oil prices do cause a nominal and real appreciation in the CIS countries and to the extent that non-oil manufacturing cannot stand the pressure, this will lead to its decreasing share in the overall industrial output and GDP. In addition, because economic growth is largely driven by oil exports in a number of CIS countries, a future drop in oil prices or the depletion of oil resources can limit their growth prospects.

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4.4 Fiscal challenges of energy resource windfall in CIS

4.4.1 Introduction

The existence of large-scale oil and natural gas reserves, apart from being a potentially mixed blessing for the economy (see section 4.2) is also a major challenge for fiscal management. In this section, we concentrate on three most important CIS energy producers: Azerbaijan, Kazakhstan and Russia[32]. The economies of these countries are heavily dependent on the rate of energy resource extraction and fluctuations of commodity prices. The appropriate fiscal response can help them to take full advantage of the energy resource windfall while limiting risks of natural resource curse.

Box 4.4.1 Lesson from past oil windfalls

In assessing the macroeconomic policy response in CIS countries to challenges related to growing resource revenues so far and in deriving recommendations for the future, we are guided by key lessons from previous oil windfall episodes. For example Gelb et al. (1988), responding to the question “What should the oil exporters have done differently?” offer insights that are relevant also for this study:

- spending levels should have been adjusted to sharp rises in oil income far more cautiously than they actually were;

- more attention should have been given to building political support for large savings abroad;

- a spending policy should have been based on less than the expected price trend, as costs of over optimistic projections proved far greater than the costs of over cautious ones;

- spending volatility should have been avoided;

- public expenditure projects should have been subject to more rigorous appraisal that took more complete account of potential risks;

- oil income should have been used, to a greater extent to finance improvements in public administration (for example non-oil tax system).

In this section, we review fiscal policy institutions and policy outcomes and evaluate them vis-à-vis the main challenges of successful windfall management:

- Ensuring sustainability
- Avoiding volatility
- Preventing wasteful expenditures

These goals can be achieved by institutional aspects of fiscal policy such as:

32 Data for Turkmenistan is too scant to conduct a similarly detailed analysis. For other CIS countries, energy resources play a much lower budgetary role, although – as discussed in chapter 3 – several economies are severely affected by energy resource developments through remittances, regional trade and investments.

- Focusing on a non-resource primary balance
- Creating savings and/or stability funds
- Spending restraints and proper oversight[33]

This basic analytical framework sets a clear methodology for this study and is reflected in the structure of this section. The analysis focuses on the period of continuous oil price increases after 2003.

4.4.2 Size of the energy resource budgetary windfall

The size of oil and gas reserves in the three CIS countries covered in this section is substantial, as demonstrated in Tables 3.1, 3.2 in chapter 3 and 4.4.1 below. Proved oil reserves in Kazakhstan and Russia have been increasing rapidly in recent years due to investments in exploration and new discoveries are also likely, especially in Kazakhstan (see EIA, 2008). Correspondingly, it is expected that oil production levels in Kazakhstan will double by the beginning of the next decade and triple over the next 10–15 years. Despite this rate of growth, peak production will not be reached before 2030 and will remain flat for the subsequent two decades, even without new discoveries (see chapter 5 for discussion). For Russia, a more mature producer with a more stable production profile, the oil windfall without major new discoveries will last for another 20 years. Although there have been no important discoveries in Azerbaijan in recent years, oil production is growing at the fastest speed. It will further accelerate to reach a peak in around 2010 and decline afterwards, making oil windfall particularly short-lived. Commercial gas extraction in Azerbaijan and Kazakhstan is still far from its full capacity and can provide room for significant growth in energy resource revenues and might partly compensate for a depletion of oil reserves (see chapter 5).

Table 4.4.1 Oil and natural gas endowments

OIL	Proved Reserves				Production			Years until reserve depletion under current production
	Thousand million Barrels 2006	Barrels per capita	% growth between 1998 and 2006	% share in global reserves	Million tonnes 2006	% growth between 1998 and 2006	% share in global production	
Azerbaijan	7.0	814	0.0	0.6	32.5	183.6	0.8	29.3
Kazakhstan	39.8	1646	59.2	3.3	66.1	154.8	1.7	76.5
Russia	79.5	391	42.7	6.6	480.5	57.9	12.3	22.3
GAS	Proved Reserves				Production			Years until reserve depletion under current production
	Trillion cubic meters 2006	Thousand cubic meters per capita	% growth between 1998 and 2006	% share in global reserves	Billion cubic meters 2006	% growth between 1998 and 2006	% share in global production	
Azerbaijan	0.9	105	50.0	0.7	6.3	20.8	0.2	>100
Kazakhstan	2.0	132	50.0	1.7	23.9	222.7	0.8	>100
Russia	48.0	337	-0.9	26.3	612.1	11.0	21.3	77.8

33 The issue of energy-sector related quasi-fiscal activities is addressed in the subsequent section of this report.

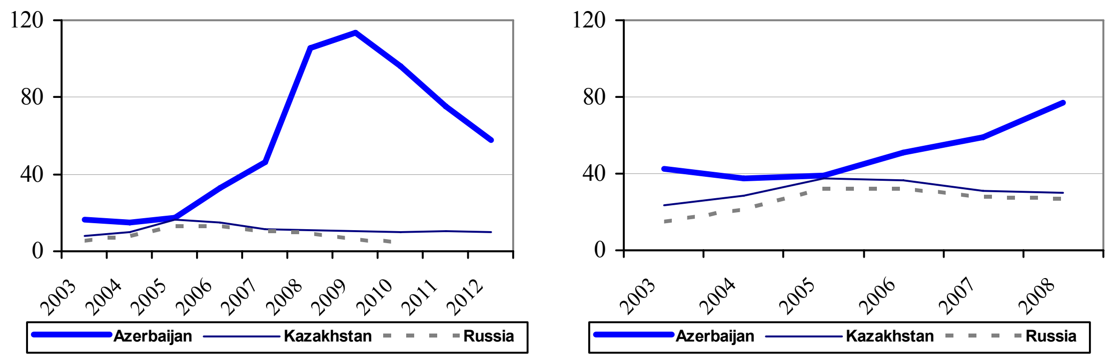
Source: BP (2007), own calculations.

The total stock of reserves translates into budgetary revenues and total stock of public wealth in a highly non-linear way depending on a number of factors:

- Extraction time profile;
- Extraction and transport costs, and required investments;
- Energy resource taxation and contracts with operators;
- Projected oil and gas prices.

While some of these factors are beyond policymakers control and others reflect past, present and future policy choices, we treat predicted revenue flows as exogenously fixed for a given price trajectory and we focus on the question of how these flows are fiscally managed. Without direct access to company specific data, we are dependent on publicly available estimates of past and predicted future budget revenue streams, coming primarily from country authorities and the IMF. However, it must be remembered that any projections are burdened with a large margin of error, especially given the current volatility in commodity markets.

Figure 4.4.1 Fiscal oil revenues as a share of non-oil GDP (left panel) and fiscal oil revenues as a share of general government revenues (right panel), %



Note: as share of GDP in case of Russia, 2003-2006 (actual), 2007 (estimated), 2008-2012 (projected)

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

Figure 4.4.1 combines the actual data with the available medium term-projections for fiscal oil revenues[34] presented as the share of non-oil GDP for Azerbaijan and Kazakhstan and as a share of GDP for Russia.[35] The most characteristic feature of this graph is the rapid expected growth of oil revenues in Azerbaijan followed by similarly rapid decline after 2010. In the peak years, budgetary oil revenues are actually expected to exceed the value of non-oil GDP. In fact, oil revenues are expected to stabilise at around 10% of non-oil GDP in Kazakhstan in the short-to-

[34] In the remainder of this section, concepts of oil windfall, oil-wealth, oil revenues etc. refer to aggregates including not only oil but also other hydrocarbons, in particular gas.

[35] The scaling of fiscal variables by non-oil GDP is essential for countries that are highly dependent on energy resources as such scaling properly shows the magnitude of the impact of oil revenues on the non-oil economy. Consistent estimates of non-oil GDP for Russia are not currently available, however given lower dependence of Russia on energy resources scaling by non-GDP is not strictly necessary.

medium term, although in the longer term government oil revenue is expected to grow very substantially from USD 4.2 billion in 2005 to about USD 16 billion during 2015–30. Oil revenues are predicted to fluctuate between 5% and 10% of GDP in Russia in the immediate future. In terms of share of total budgetary revenues, oil revenues in Kazakhstan and Russia have stabilised in recent years at a level of 30%, while in Azerbaijan they continue to explode, now nearing 80%.

In the next section we analyse how resource endowment translates into the overall fiscal sustainability framework and the degree to which actual policies are consistent with this framework.

4.4.3 Sustainability of fiscal policies

The simplest definition of sustainability implies the ability to maintain the current fiscal policy stance while remaining solvent (Burnside, 2005). In the case of resource rich economies, this definition translates into preservation of the existing stock of total public wealth that can be approximated as energy resource wealth net of external public debt. The reason is simple: as energy resources are exhaustible, fiscal policy should ensure that any reduction in the country's resource reserves be compensated by the accumulation of other asset forms such as financial, physical or human capital to prevent the need of policy reversal at a time of resource depletion. The analytical benchmark for assessing fiscal sustainability is therefore the consistency of the rate of consumption out of wealth (measured by the non-oil deficit) with the preservation of total wealth. This is the straightforward implementation of the Permanent Income Hypothesis.

There are several versions of the simple constant wealth rule. The wealth can be kept constant in an absolute sense or as a share of non-oil GDP. The more conservative approach is the bird-in-hand strategy that involves only spending the interest on already accumulated financial assets[36]. This last rule is especially (and rather excessively) restrictive for countries that have recently started to accumulate financial assets, as with CIS countries, nevertheless it has nominally been the guiding principle of oil wealth management in Azerbaijan[37].

Table 4.4.2 presents estimates of sustainable non-oil deficits predicted by the simple rule of keeping total wealth constant as the share of current non-oil GDP (Azerbaijan and Kazakhstan) or total GDP (Russia). These estimates are highly dependent on oil price predictions, as well as real growth and real interest rate projections. In each case, recognising the need for sustainability implies that fiscal management should target not only the overall fiscal balance but, in addition, a non-oil fiscal balance that reflects properly the rate at which total wealth is being depleted. Table 4.4.2 implies that even under conservative assumption for future oil prices, the fiscal sustainability in Kazakhstan is well established, as the actual deficit is comfortably within the sustainability threshold. The recent policy relaxation in Russia implies that the policy is just outside the sustainability range; however, the announced policy tightening for 2010-2011 (see discussion below) should correct this situation. The outlook is less positive for Azerbaijan where most recent and currently projected expenditure expansion makes fiscal stance clearly unsustainable.

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36 This rule has guided policies in Norway since 2001.

37 Nominally, because a large share of oil revenues has been in practice channelled directly to the budget (see discussion of oil fund rules in later subsections).

Another illustration of sustainability in the policies is distribution of oil revenues between spending and savings is presented in Figure 4.4.2. The sustainability of current policies in Kazakhstan and Russia is clear; more than half of the windfall has been saved across the period. In contrast, Azerbaijan has saved only less than one tenth of its total oil revenues so far. The laxity of fiscal policy in Azerbaijan is particularly surprising given the short predicted duration of its oil windfall, which should encourage savings from oil for inter-temporal consumption smoothing.

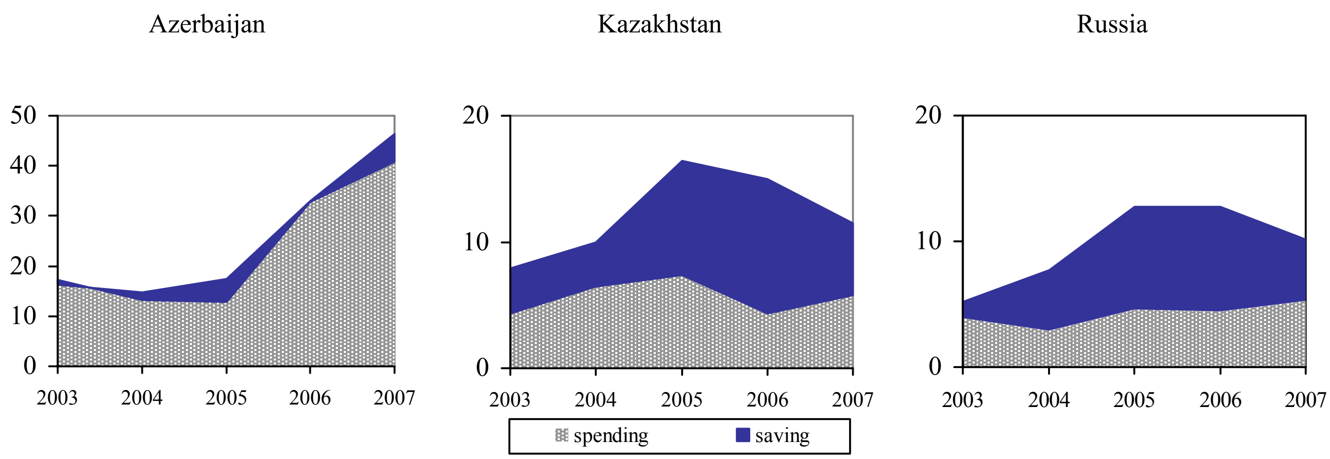
Table 4.4.2 Estimates of oil wealth and sustainability of current policies

	Azerbaijan	Kazakhstan	Russia
Sustainable non-oil deficit as % share of non-oil GDP	25 (approx) (at USD 60 per barrel)	13.4 (at USD 60 per barrel)	3.7 (at USD 66 per barrel)
Estimated non-oil deficit in 2007 as % share of non-oil GDP	40.8	5.8	5.3

Note: as share of GDP in case of Russia

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, 2007 and own calculations.

Figure 4.4.2 Spending and saving out of oil and gas revenues (as percent of non-oil GDP)



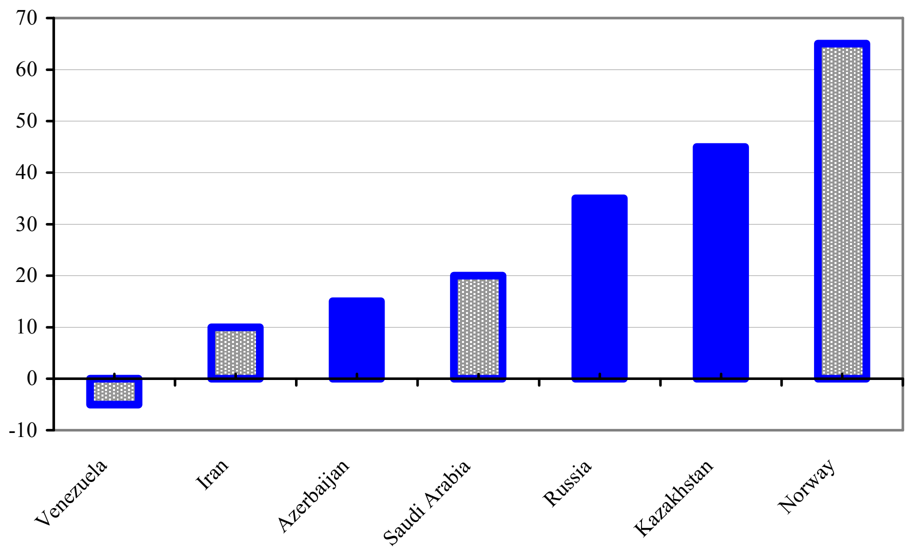
Note: as share of GDP in case of Russia, 2003-2006 (act.), 2007 (est.)

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

Figure 4.4.3 drawn from the IMF study supports the observation that savings from oil revenues have been higher in Kazakhstan and Russia than in most other oil-producing countries (note that after 2005 oil savings in these two countries increased further).

The outlook of sustainability will change depending on future oil price fluctuations, but also in response to changes in fiscal policies. Kazakhstan is expected to maintain its prudent policy stance. The Russian authorities are relaxing policies in the short-term, leading to the cumulative increase of the non-oil deficit by 3.2 percentage points of GDP in 2007-2009. This relaxation is intended to be temporary, as the newly approved medium term fiscal framework to be introduced by 2010-2011 will require expenditure reduction of 2% of GDP to meet the permanent ceiling on the non-oil deficit of 4.7% of GDP, just above the conservative sustainability threshold[38]. Unfortunately, it has been proved repeatedly that delayed fiscal adjustments often do not actually happen. Such a risk in Russia is significant because necessary cuts in social spending would be difficult to implement in the wake of 2011 parliamentary elections, with raising pressure to adjust falling pension replacement rates.

Figure 4.4.3 Oil savings as a share of oil revenues (2003-2005)



Source: IMF country report no. 06/244.

In the case of Azerbaijan, it is essential that a substantial share of the upcoming peak in oil revenues is saved. According to IMF estimates, the pace of expenditure growth has to be slowed substantially no later than 2008 to maintain country's fiscal sustainability. Unfortunately, such a scenario is unlikely as the authorities expressed a "desire to raise wages and pensions to improve living standards at the beginning of oil boom". Accordingly, fiscal adjustment is expected to be delayed until 2012, i.e. after the peak of oil production. However, if earlier adjustment does not take place and oil prices fall to USD 40-50 a barrel, the financial assets accumulated so far will be depleted before the beginning of the next decade.

When analysing future fiscal trends, it is important to remember that past oil booms demonstrated important asymmetries in fiscal policy adjustments. While oil windfalls led to rapid increases in expenditures, the subsequent falls in oil prices did not cause similar reductions but rather rapid external debt accumulation. The expenditure overshoot, combined with the ratchet effect, constitutes a substantial fiscal sustainability risk for Russia and particularly Azerbaijan.

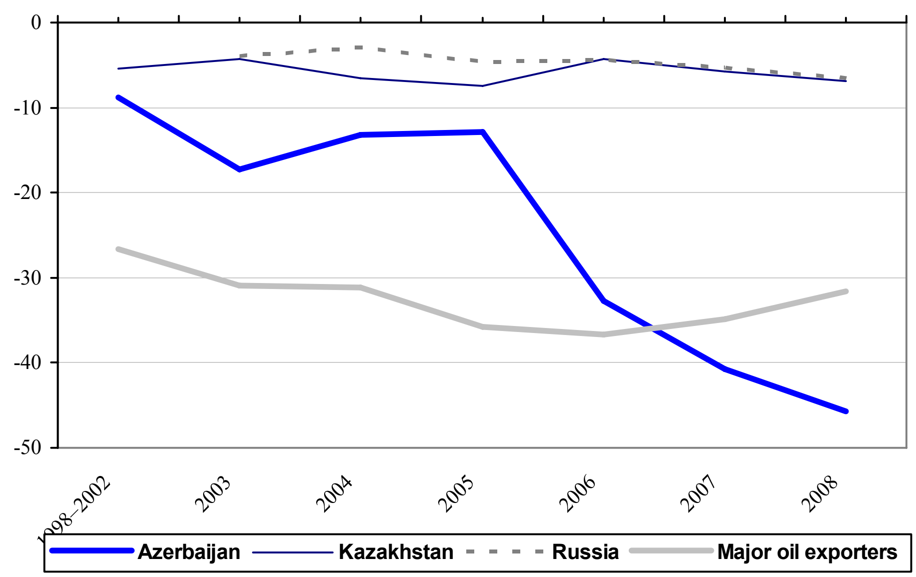
38 Indeed it is explicitly recognised that transfers of revenues from oil and gas to the budget should not be higher than 3.7% of GDP derived from sustainability analysis.

4.4.4 Volatility of fiscal policy

Sustainability requires avoiding the temptation to spend all current oil revenues and using them either to repay public debt or to build reserve financial assets. These assets can be spent after energy resources are depleted or if their prices fall. However, the role of fiscal policy is perhaps even more important in mitigating, and at least not amplifying, the impact of fluctuating oil revenues on the vulnerable non-oil economy. This can be achieved by stabilising non-oil deficits, the best measure of actual fiscal policy impact in an oil-rich economy. This kind of non-cyclical or anti-cyclical policy reduces the demand pressure, helps to control inflation and exchange rate appreciation by supporting monetary policy in sterilising excessive foreign exchange inflows.

The permanent income rule prescribes the sustainable level of spending from oil, based on the estimate of total oil wealth, and therefore reduces the volatility of spending[39]. However, sustainability frameworks do not often guide actual short-term policy-making. In contrast, in many past oil windfall episodes the expenditure level was directly influenced by the current size of oil revenues as policy makers focused their attention on the overall fiscal balance rather than on non-oil balance. As oil revenues were temporarily high, non-oil deficits deteriorated. This led directly to the pro-cyclicality of fiscal policies.

Figure 4.4.4 Non-oil deficits as share of non-oil GDP



Note: as a share of GDP in the case of Russia, 1998-2006 (act.), 2007 (est.), 2008 (proj.)

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

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39 The oil wealth estimate is obviously subject to a large degree of uncertainty and changes in the event of new discoveries or adjustments in long-term oil price predictions. However, big new discoveries are not frequent and oil price changes used to have a large temporary element. Barnett and Vivanco (2003) showed that 60% of any price shock is expected to be reversed within the following year (the current estimate could be in fact lower taking into account the massive post-2002 energy price increases) and therefore should not strongly influence the estimated value of oil wealth.

Figure 4.4.4 presents the actual development in non-oil deficits across three analysed countries compared to the group of oil producers from the Middle East and Asia. While Kazakhstan and Russia seemingly outperform other oil producers not only in terms of sustainability but also in terms of stability of fiscal policies, Azerbaijan's policy seems to be extremely volatile.

Fiscal policy in Kazakhstan remained prudent throughout the analysed period and stable non-oil deficits did not amplify the volatility of the economy. This framework is expected to be maintained in the future despite gradual relaxation of policies in the medium-term.

In Russia, stabilisation against volatility of oil prices seems to have been quite successful. Although fiscal policy was increasingly expansionary starting from 2005, the scale and speed of expansion was moderate. However, prospects for further relaxation followed by the intended tightening discussed above may bring a risk of more pro-cyclical policies in the future.

In Azerbaijan, non-oil deficits started to increase rapidly beginning in 2003 and at a breakneck speed after 2006. The hike in oil revenues of close to 120% in 2006 was translated into a rise in the share of the non-oil deficit from 13% of GDP in 2005 to 33% in 2006, and this trend has continued. Political considerations are playing a role, with the planned presidential election set to lead to further expansion in 2008. The necessary adjustment that would need to take place after 2012 will produce another shock to the non-oil economy.

We provide in Table 4.4.3 a summary assessment of the quality of fiscal oil wealth management by looking at two key indicators: volatility of non-oil deficits and the correlation between changes in oil revenues and changes in total levels of spending. The table shows that volatility of the non-oil deficit in Azerbaijan has been much higher compared to Kazakhstan and Russia, even adjusted for the average size of the deficit. Secondly, real growth rates of public expenditures and oil revenues have been very strongly correlated. In contrast, in Russia the correlation has been much lower, while spending in Kazakhstan has been completely uncorrelated with oil revenues[40].

Table 4.4.3 Indicators of non-oil deficit volatility (2003-2007)

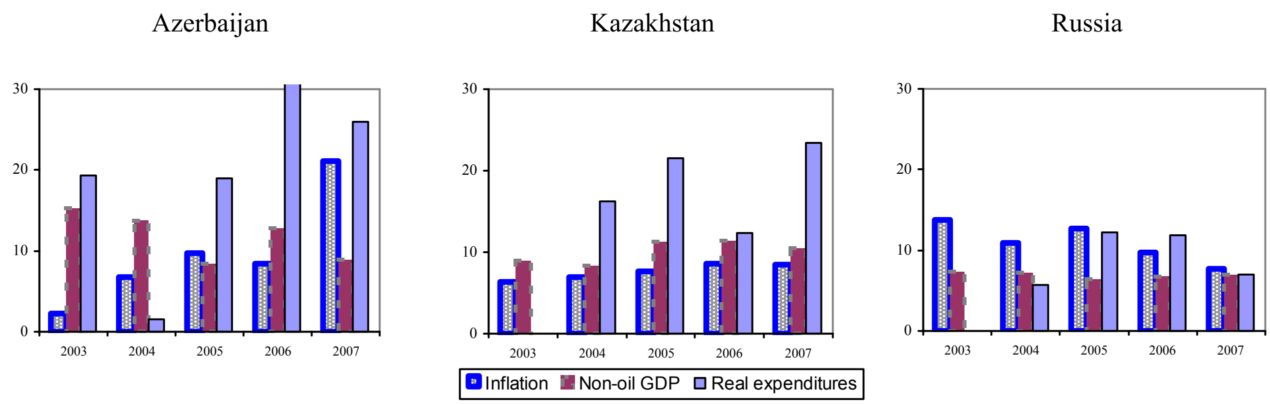
	Azerbaijan	Kazakhstan	Russia
Standard deviation of non-oil deficit	12.6	1.3	0.9
Correlation of real growth rates of expenditure and oil revenues	0.97	-0.13	0.34

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

Finally, it is essential to see the extent to which fiscal relaxation due to oil revenues have been pro-cyclical in the broader sense, i.e. by how much they add demand pressure to an already overheated economy. Figure 4.4.5 contrasts the rates of real growth of expenditures with real GDP growth and inflation rates. It is clear that rapid increases in expenditures, especially but not exclusively in Azerbaijan, have led to a large shock in the non-oil economy. This shock has been reflected in the inflation rate, which has negatively impacted these extremely buoyant economies. In this sense, the continued fiscal expansion is strongly pro-cyclical.

40 However, it should be noted that our short sample covers exclusively the period of rising oil prices, therefore this correlation has to be treated with caution.

Figure 4.4.5 Overheated economies and real expenditure growth



Note: 2003-2006 (act.), 2007 (est.). The real growth rate of expenditures in Azerbaijan exceeded 70% in 2006.

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

4.4.5 The institutional underpinnings of the fiscal management of oil windfalls

There are a number of institutional solutions practiced in resource-rich countries to mitigate challenges associated with windfall revenues. They include special saving, stability and financing funds, but perhaps even more importantly – fiscal rules and guidelines often reflected in the legislation and medium-term expenditure frameworks (MTEFs)[41]. The existence of an overall fiscal framework and rules is essential as oil funds are not substitutes for a strong commitment to fiscal discipline and long-term policy planning perspective. As money is fungible, increased borrowing can offset any savings in oil funds. Borrowing is particularly easy at a time of high oil prices, which can contribute to policy pro-cyclicality. Therefore, while the establishment of oil funds is usually perceived as a sign of good will in maintaining prudent fiscal policies, their role is only supportive. This role can be best performed when oil funds are fully integrated with the budget. Ideally, the establishment of funds should put non-oil deficits at the core of fiscal policy-making by clearly separating non-exhaustible non-oil and exhaustible oil revenues. Finally, accountability and transparency in operations of funds are critically important for successful management of financial assets and building political support for savings[42].

In this context, it is disappointing that, according to the IMF, only one out of 27 countries that established oil funds has its operation fully linked to the policy rule reflected in the MTEF. Most funds focus on a narrowly defined stability and – to a lesser degree – savings. Davis et al. (2003) find evidence that the existence of the funds had led to a reduced correlation between expenditures and prices, although did not influence the overall level of spending. Results of various studies differ; however, there is a wide consensus in the literature about the limited role of

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41 Such rules are not specific to resource rich countries but are common also in other countries.

42 In practice, the definition of oil revenues tends to play the important role, as excluding certain revenue streams that are clearly related to extraction of resources can blur the true fiscal position. On the other hand, quasi fiscal operations can also hide – due to price distortions – the true speed at which the energy wealth is being consumed.

funds in managing oil windfalls. With this in mind, we evaluate the effectiveness of institutions of oil wealth management in Azerbaijan, Kazakhstan and Russia.

The State Oil Fund of the Republic of Azerbaijan (SOFAZ) was established in December 1999 to provide collection and effective management of assets, generated from contracts signed for natural resource extraction[43]. However, a number of problems existed, the key being an acute lack of consolidation between the state budget and the Fund that has its own spending programmes. Consequently, SOFAZ expenditures were officially coordinated but not effectively supervised by the Ministry of Finance. This weakness was subsequently improved and now the SOFAZ financial plan is a part of the annual consolidated budget that is approved by Parliament. The State Treasury processes all its expenditures.

In the first years of operations, SOFAZ transfers and expenditures were limited solely to interest revenue flows (a very restrictive "bird-in-hand" model). However, unlike oil funds in Kazakhstan and Russia, which are primarily focused on accumulating foreign exchange assets, expenditures can be used for "solving the major problems affecting the nation", in particular, financing infrastructure, supporting socio-economic progress, but also supporting the living conditions of internally displaced persons. This implies that the Fund is less effective in sterilising the large oil revenue inflows, reducing currency appreciation and inflationary pressures.

Most importantly, Azerbaijan lacks a proper framework for the fiscal management of its oil windfall, focusing on the non-oil deficits and explicitly recognising sustainability and stability goals. Long-term oil revenue strategy is still not operational. While oil fund spending should be consistent with the public investment program (PIP) and MTEF, these documents are not currently approved by Parliament. Also, not all oil revenues are channelled to the Fund. As a result, the institutional underpinning did not prove effective enough to prevent massive spending from oil, as demonstrated in the previous subsections. Consequently, the total assets of the Fund were USD 2.5 billion in December 2007, a very low figure when compared to the size of oil revenues so far. As was mentioned above, these financial assets could become easily depleted if the current trend in fiscal policies continues.

The National Fund of the Republic of Kazakhstan (NFRK) was established in August 2000 to stabilise government revenues from natural resources and save part of these revenues for future generations. The rules of accumulation have been complex and changing. Originally, only payments from 12 selected companies were directed to the Fund and this list was further reduced to 7 in 2004. From these revenues, only 10% were directed to the Fund (as a savings component) while the stabilisation component consisted of all revenues above the threshold price of USD 19 a barrel. In theory, the NFRK can be used when prices fall below the threshold; however, this has not happened to date. Also, part of privatisation proceeds, royalties and bonuses on signing contracts have been directed to the Fund. The Fund is managed by the National Bank of Kazakhstan on behalf of the government and is entirely invested in foreign assets. Given the imperfections of the institutional set up of the NFRK, the example of Kazakhstan shows that a commitment to prudent fiscal policies is more important than a strict institutional framework.

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43 Azerbaijan was the first oil-producing country to issue an Extractive Industry Transparency Initiative (EITI) report. Detailed quarterly reports from the SOFAZ are available on the internet. Its annual report is audited by international auditing company and more currently also by the Accounting Chamber of the Parliament. For more discussion of governance structure of the SOFAZ and NFRK see Kalyuzhnova (2006).

Major improvements to this framework are currently planned. These include broadening the revenue base of the NFRK, redesigning it and fully integrating it with the budget. Eventually, the NFRK will be transformed into a fund that would exclusively provide financing for the budgetary non-oil deficit. The size of the non-oil deficit will not exceed the sustainability threshold and will not be higher than development spending, with the aim of increasing the long-term capacity of non-oil economic growth. This prudent approach effectively assumes the full conversion of oil revenues into either financial or physical capital[44].

The Oil Stabilization Fund (OSF) in Russia was established in January 2004, i.e. later than in the other two countries. The stated goal was to provide a buffer between oil revenues and the budget, and to insure the public sector against the risk of oil price falls[45]. All revenues above USD 20 a barrel related to taxes on oil[46] were directed to the fund and the price threshold was subsequently increased to USD 27 a barrel. The fund also absorbed the remaining overall budgetary surplus at the end of the year. This source proved substantial due to conservative projection used for budgeting. While oil prices soared, savings in the OSF proved larger than initially expected. The fund actually absorbed around one quarter and one third of overall oil and gas revenues, respectively. The accumulated assets are currently invested in the foreign currency denominated account of the Central Bank of Russia with interest determined by a basket of first rate foreign sovereign bonds, although the Ministry of Finance can also invest in eligible foreign fixed income instruments directly. The investment strategy excluded any higher risk assets.

Comparison of the distribution of oil windfall in 2003 and 2004, i.e. before and after the introduction of the OSF, suggests that this institutional arrangement was indeed instrumental in disciplining policies: while oil revenues in 2003 were mostly used for financing the non-oil deficit, they were largely saved in 2004. According to fund rules, withdrawals were permitted when oil prices fell below the threshold or size of assets reached 500 billion roubles. This threshold was reached sooner than expected and assets reached around 9% of GDP at the end of 2006. Consequently, some OSF resources were used to repay part of the external debt but also to provide funding for the pension system. The latter obviously reduced its stabilising and saving role. More generally, the rapid accumulation reduced public support for further savings (Astrov, 2007). Consequently, the existing oil stabilisation fund was split into two separate funds in February 2008. The stabilisation oriented reserve fund will be capped at 10% of GDP starting in 2008. Once this limit is reached, oil revenues feed the National Welfare Fund (NWF), with a more prominent saving functions. It was announced in 2007 that the NWF would invest in higher yield instruments. Following market disturbance in past months, this strategy has not been introduced yet. A Russian government decree limited investment opportunities to foreign currencies, sovereign bonds of selected developed countries and their state agencies, as well as deposits in financial institutions with highest ratings. Still, it is possible that investment guidelines expected by the end of 2008 will eventually allow investments in corporate securities and investment funds.

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44 Doubts as to the productivity of public investments in oil rich countries are discussed in the following section.

45 Vatansever (2005) argues that the decision to establish the Fund reflected also “the government’s desire to achieve greater control over the revenues collected from the oil sector, as well as its expanded ability to do so as opposed to the preceding Yeltsin period”.

46 Revenues from gas and oil products were excluded. OSF accumulation was based initially on 40% of total tax base of oil and gas revenues in 2004 and 2005.

Beyond this, an even a more important reform is planned. A medium term fiscal framework is being introduced (the first 3-year plan for budget and extra budgetary funds was prepared for the years 2008-2010) with the concept of the non-oil deficit playing the role of the guiding principle. It is intended that after 2011 the non-oil deficit will not exceed 4.7% of GDP (with the cap on financing from oil revenues at 3.7%). The residual of oil revenues (this time including also gas and oil extraction and export taxes) will be directed to the NWF. If the new framework is indeed implemented in 2011, it would give Russia one of the most robust institutional bases for sound oil windfall management across the spectrum of oil producing countries. Nevertheless, it remains to be seen whether this institutional basis will be able to counterbalance the increasing political pressure for higher spending.

4.4.6 The use of oil wealth

So far we have focused on levels and volatility of overall spending financed from oil. However, in managing oil wealth, it is critical to ensure that this spending is not inefficient or simply wasteful. The empirical evidence shows that the risk of wasteful expenditures is substantial during rapid increases in public spending (including investment). The efficiency consideration therefore creates additional motivation for spending restraints, given the risk of the expenditure "ratchet effect" mentioned before. The pace of increase in spending as shown in Figure 4.4.5 was however extremely high, especially in the case of Azerbaijan. We also look at the size of spending in terms of non-oil GDP in Figure 4.4.6. Despite rapid increases in real terms, these shares are kept at a manageable level in both Kazakhstan and Russia, but explode in Azerbaijan. So far, the authorities have showed relatively little enthusiasm for reducing the tax burden on the non-oil economy, as shown in Figure 4.4.7. This might be an important error given the vulnerability of the non-oil economy on the one hand and low government capacity in managing development programs on the other. [47]

The rapid increase of expenditures in Azerbaijan is taking place in the context of modest progress in transparency of budgetary expenditures, management efficiency and audit capacity. When analysing capital spending, it should be noted that Azerbaijan still records very low scores in terms of corruption, business climate and transparency (including public tendering and procurement). Nevertheless, according to IMF documents, the authorities maintain that all expenditures incurred involve the most critical projects in the social sphere (schools and hospitals) as well as physical infrastructure (roads, railways, power, irrigation) and they are badly needed following years of underinvestment. The need for rapid improvements in infrastructure is, in their view, more important than considerations about real but manageable implementation problems. As result, they can commit the error of underestimating the risks of waste and corruption. Characteristically, the authorities seem to believe that the most important needs should be fulfilled by the end of 2008, allowing for less rapid growth thereafter. This argument is rather questionable taking into account the spending ratchet effect characteristic of past oil windfalls.

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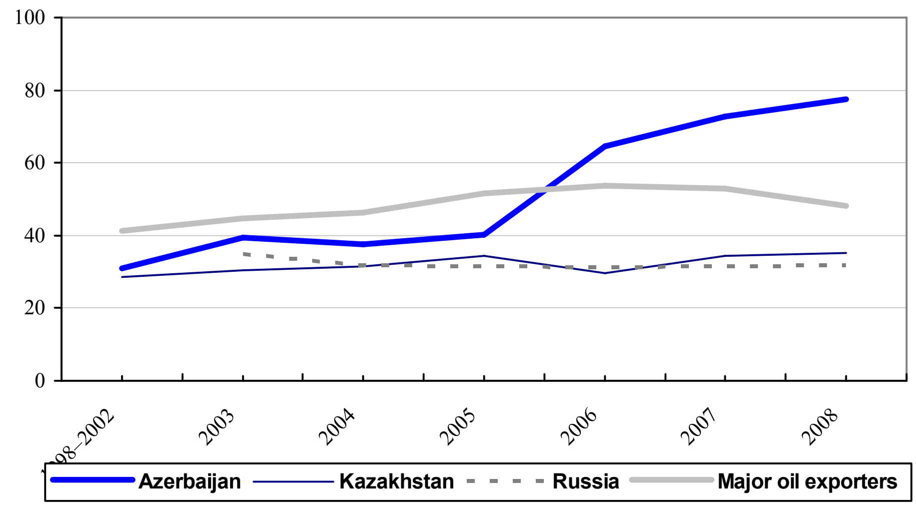
[47] An additional important challenge for geographically large countries such as Kazakhstan and Russia is to achieve the appropriate degree of regional redistribution of oil revenues. Najman et al. (2007) argue that fiscal federalism with revenue-sharing arrangements was tentatively developed in Kazakhstan, but criteria remain obscure. As a result some richer regions, notably the capital city of Astana and financial centre of Almaty benefited disproportionably from the windfall. Kwon and Spilimbergo (2005) demonstrate that while revenues and expenditures are highly correlated with oil shocks at regional levels in Russia, federal transfers played a minor role as an inter-regional adjustment mechanism. The issue of regional redistribution of oil windfall is discussed in more detail in the section 4.7 of this report.

Figure 4.4.6 Spending as a share of non-oil GDP

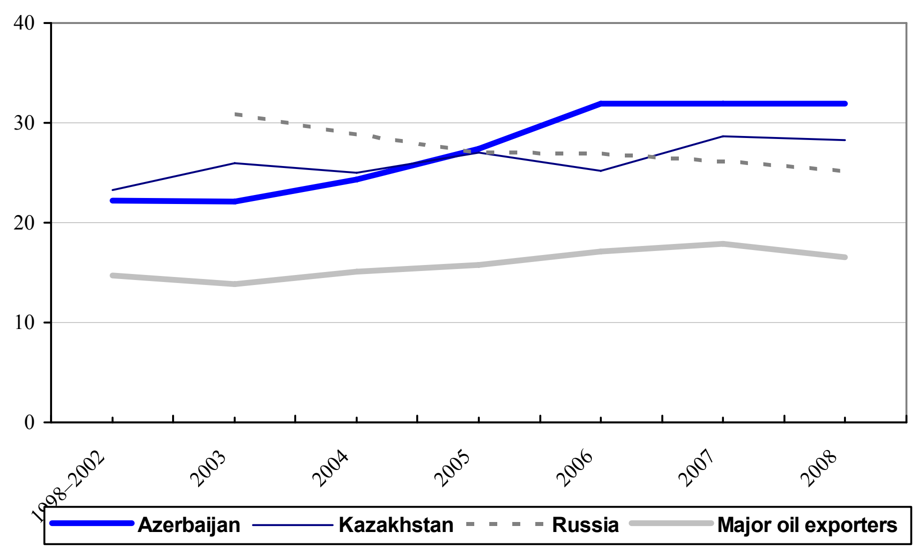


Note: as share of GDP in case of Russia, 1998-2006 (act.), 2007 (est.), 2008 (proj.).

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

The authorities in Azerbaijan are also intending to broaden the tax base and reduce tax rates. The most important direction of changes is the elimination of VAT exemptions. Other challenges involve enhancing taxpayers' self-assessment and voluntary compliance, including early registrations for VAT refunds. Improving the tax administration and broadening the tax base in the economy with a large share of informal sector would not be easy while there is little or no evidence that any substantial resources have been allocated to this goal.

Figure 4.4.7 Non-oil revenues as a share of non-oil GDP



Note: as share of GDP in case of Russia, 1998-2006 (act.), 2007 (est.), 2008 (proj.).

Source: IMF country reports, IMF Regional Outlook: Middle East and Central Asia, Oct 2007 and own calculations.

The recent growth in expenditures in Kazakhstan has occurred mainly through public sector wage increases. The Sustainable Development Fund was created to supervise the large investment programs in infrastructure and building capacities in new industries. However, since 2007 the focus has changed towards reduction of the fiscal burden levied on the private non-oil sector, mostly through the tax changes discussed below. Kazakhstan is reducing VAT from 15% to 14% and a further reduction to 12% is considered. The country also introduced the 10% flat personal income tax (to replace the progressive scale of 5-20%) with a higher minimum threshold. From 2008 social contributions are also expected to be reduced by some 30% to around 5-13% with harmonisation across domestic and foreign workers. Rather worryingly, more tax exemptions for the Free Economic Zones and selected high value added industries are also expected.

In Russia, spending growth so far is mainly taking place through expansion of recurrent expenditure in social sectors, especially subsidising the pension fund, which is troubled by low contribution compliance. At the same time, it is apparent that in the face of increasing available resources, the pace of efficiency enhancing reform in social sectors has slowed. A more detailed analysis of expenditure efficiency in the social sphere by the IMF suggests there is substantial room for improvement, particularly in health care and social protection and especially at the regional level. Ill-targeted programmes of subsidising housing, energy and utilities should be increasingly replaced by means-tested benefits with much more of a poverty-reduction impact. The availability of oil revenues might delay necessary reforms even further.

Authorities plan to allocate more resources into investment projects in future with the intention of increasing the country’s long-term growth potential: infrastructure and housing projects, research programmes as well as investments in aluminium, petrochemicals, nuclear power and other sectors. It is, however, doubtful as to whether promoting industrial sectors should be within the scope of government intervention. Also in Russia, the low quality of management in the public sector raises the question mark of the efficiency of increased expenditures. To address this problem, the government plans a move towards performance budgeting and performance indicators covering 70% of all budgetary revenues. It remains to be seen whether this will bring the expected results.

4.4.7 The external dimension of oil-based asset management

The fast increase in the total size of assets under the management of sovereign wealth funds has recently led to an international debate on their global impact. According to data collected by Morgan Stanley, sovereign oil funds command 2% of world traded securities and this number is higher than combined private equity and hedge funds[48]. Because assets of sovereign oil funds are growing at a very high pace, they are likely to triple within the next 5 years to around 3% of total traded securities.

The oil funds of the three analysed CIS countries remain relatively small compared to the USD 2.9 trillion of global sovereign wealth fund assets. This is particularly true for funds in Azerbaijan and Kazakhstan, which both amount to less than 1% of total assets of oil and gas based sovereign

[48] Cited by The Economist, 19 January 2008.

funds (USD 2.1 trillion). However, Russia - with a share of 7.5% of the global stock - has the largest sovereign fund among emerging market economies after China and the Gulf states[49]. Its growth rate is also impressive: in 2007 alone it increased by USD 67 billion or by 76%.

Table 4.4.4 Assets of sovereign oil and gas based funds

	USD billion	Share in total global sovereign funds
Azerbaijan	2.5	0.1%
Kazakhstan	21.0	1.0%
Russia	156.8	7.5%
Total oil and gas based sovereign funds	2103	

Source: Morgan Stanley, national authorities.

The rapid increase in the assets of sovereign wealth funds is being subject to increasing international scrutiny because of their potential impact on prices and markets, given that they can be potentially driven by goals different from pure profit making and risk minimisation. These other goals may include political or geopolitical considerations and securing access to strategic resources. As the transparency of sovereign fund investments is often low and decisions tend to be discretionary, rumours about changes in asset allocations can strongly influence the markets. An increasingly suspicious attitude towards sovereign wealth funds may make investment more complicated and further discourage savings of a substantial part of oil wealth abroad. In the worst-case scenario, it could lead to the new kind of protectionism in financial market policies. This would strip sovereign funds of vital asset diversification opportunities. However, the example of the oil-based Norway Government Pension Fund proves that such difficulties can be minimised by strict rules concerning: transparency of investment goals, regular (quarterly) and detailed disclosure of asset positions, high diversification (shares of 3,500 companies and bonds in 27 countries) and minority rather than majority shares in any company (less than 1% in any company). In contrast, secretive and manipulative investments could potentially backlash. While the latest capital injections by sovereign wealth funds (without participation of CIS funds) into major western investment banks have been generally welcomed, this is a rather exceptional situation. Other past examples of strong resistance towards large scale sovereign fund investments in domestic enterprises confirm the advice of a former US official "If you want to invest in the US, be boring… Try to look like everyone else"[50].

Investment activity of Russia, the former superpower with large assets under management, may come under increased scrutiny, with a spillover effect to the sovereign funds of Azerbaijan and Kazakhstan. So far, the sovereign funds of oil producing CIS countries have avoided these controversies partly due to very conservative profile of their investments. The last detailed figures from the State Oil Fund of the Republic of Azerbaijan show that only 0.3% of assets were invested in equities, with the large majority of portfolios consisting of debt securities, mostly of investment grade financial institutions. This conservative approach was reflected in an annualised nominal return of only 3% between 2001 and 2006. Similarly, the Russian Oil Stabilization Fund

49 This share would be reduced to 1.5% of global sovereign wealth fund assets, if only the assets of the newly created National Welfare Fund of Russia were taken into account.

50 Cited by The Economist, 19 January 2008.

did not invest in equities, nor did the recently created Reserve Fund. Funds in both countries hold portfolios of assets balanced in terms of denominations in US dollar, Euro and British Pound. The least information is available about the current investment portfolio of the National Fund of Republic of Kazakhstan. However, the initial investment guidelines and scant public statements from the National Bank of Kazakhstan suggest that the Fund follows a similarly conservative investment policy, although exposure to international equity markets is allowed in its savings portfolio.

The status quo might change when the newly created National Wealth Fund of Russia eventually shifts its investment strategy towards higher return assets. If at any point this Fund is used to purchase larger shares in foreign enterprises which are viewed as part of essential infrastructure, such as utilities, energy, transport, banking and defence, this may become an issue in economic relations between Russia and the European Union.

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4.5 Quasi Fiscal Roles of the Energy Sector

4.5.1 Introduction

During more than a decade of transition, most of the CIS countries avoided radical reforms of their energy sectors, afraid of possibly undesirable social and political implications (Chapter 6 provides a more general discussion of energy sector policies). The authorities treated the provision of energy to the population and enterprises as their key political task, while considerations related to its costs attracted much less attention. Therefore, the energy sector in many CIS countries is characterised by slow progress in tariff and payment reforms and the domination of vertically integrated large state-owned monopolies with weak corporate governance structures and lack of an independent regulator. The gas sector has remained the least reformed. On a more positive note, many countries have started to restructure their electricity sectors. However, even countries that have undertaken electricity sector reforms by unbundling remain reluctant to reform tariff policy. By maintaining administratively set prices of natural gas and electricity at levels below recovery costs, with a tolerance of low bill collection rates and excessive operational losses (including theft) the CIS countries have implicitly subsidised domestic energy users, i.e. other sectors of the economy and households. Such government-sponsored implicit subsidy schemes can be described as quasi-fiscal activities (QFAs) of the energy sector.

QFAs cause not only inefficiencies in the sector but may also undermine macroeconomic stability. All CIS energy sectors face problems related to the aging of their industrial capacities, while existing tariff schemes do not appear to ensure sufficient profit to stimulate infrastructure investment. Thus, pricing policy is one of the major obstacles from the perspective of private investment in the sector. Furthermore, QFAs lead to over-consumption and waste of resources, increasing energy intensity of economies and hampering efficient resource allocation by supporting loss-making enterprises and taking away public resources from priority needs. QFA is an obstacle to structural change of the economy as it creates disincentives for companies to restructure themselves. Finally, energy subsidies have been financed in some CIS countries by accumulating external public debt, making them fiscally vulnerable.

Such quasi-fiscal roles played by the energy sectors in several CIS countries are analysed in this section of the report. It provides analysis of the quasi-fiscal subsidies in energy sector and progress in their elimination and attempts to draw policy conclusions that point to the need to abolish cross-subsidisation, increase energy prices and improve payment discipline. The analysis is organised as follows. The next section discusses conceptual and methodological issues related to QFA in the energy sector in general and in CIS countries in particular and the key mechanisms by which the energy sector fulfils a quasi-fiscal role. The subsequent subsection provides a methodological framework and estimation of QFA in some CIS countries. The whole analysis is concluded in a separate sub-section.

It is worth noting that QFAs are a matter of concern for most CIS economies, oil and gas producers / exporters and importers alike. The focus of this section (also in terms of country coverage) is thus somewhat different from most other sections of chapter 4. The energy sector here is understood broadly, incorporating, notably, gas and electricity distribution, which may be particularly important from the perspectives of QFAs.

4.5.2 The major mechanisms by which the energy sector fulfils quasi-fiscal roles

The concept of quasi-fiscal activity (QFA) refers to operations that "could in principle be duplicated by specific budgetary measures in the form of an explicit tax, subsidy, or other direct expenditure" (Mackenzie and Stella, 1996). The IMF *Manual on Fiscal Transparency* defines QFA as operations that result in a net transfer of public resources through non-budget channels (IMF, 2001).

Such operations occur when a central bank, state-owned commercial banks or non-budgetary institutions provide implicit subsidies in the form of multiple exchange rate regimes, direct lending at below market rates, prices for certain good and services set below market or cost recovery level, etc. The most extensively researched are the QFAs of financial institutions, while other types of such activities including those related to the energy sector have been less investigated particularly because of unavailability and inaccuracy of data required for quantitative analysis. However, quasi-fiscal activities in the energy sector are widespread in transition and some developing countries and constitute a menace for macroeconomic stability. In the CIS countries this is the legacy of energy pricing inherited from the Soviet past; where prices did not reflect costs but were set to attain certain social goals such as affordability of energy for households or the survival of (often inefficient) companies.

Several papers have addressed the issue of QFAs in the CIS. Petri, Taube, and Tsyvinski (2002) propose two methodologies to estimate energy-related quasi-fiscal activities – an end-product and a financial balance approach – and analyse such activities in some former Soviet Union countries with special emphasis on Azerbaijan (financial balance approach) and Ukraine (end-product approach). Saavalainen and ten Berge (2006) using the end-product approach expand the analysis to almost all CIS countries. Freinkman, Gyulumyan and Kyurumyan (2003) estimate the quasi-fiscal deficits in Armenia based on the flow-of-funds approach, and identify the main recipients and donors of quasi-fiscal financing. Vinhas de Souza and Catrinescu (2006) produce the estimation of quasi-fiscal activities in the energy sector of Moldova and find that despite a decline in QFAs in recent years due to reforms in the electricity sector, they are still sizeable in the gas sub-sector. All in all, these papers conclude that energy QFAs are large in resource-abundant CIS countries that export energy products and therefore have financial room to offset non-payment and below-market prices. In addition, the lack of transparency also contributes to QFAs since it creates opportunities for interested parties to extract rents from gas wealth.

Petri, Taube, and Tsyvinski (2002) suggest the following main sub-components of QFAs in the energy sector: (1) setting the tariffs lower than the cost recovery level, (2) arrears to energy companies because of non-payments or payments not being made in full, (3) excessive losses or theft, (4) non-cash payments and (5) government guaranteed borrowing. However, estimating each of these sub-components is challenging. Firstly, the energy sector in the CIS countries is dominated by state-owned enterprises that are reluctant to provide data, insisting it is a commercial secret. Existing data are sometimes unreliable due to lack of technical expertise at the energy companies in the CIS countries and not applying generally accepted accounting principles.

Secondly, the assessment of mispricing remains a problem since methodologically it is difficult to measure cost recovery prices. Petri, Taube, and Tsyvinski (2002) point out that "in the case of natural gas and electricity, estimating mispricing is necessarily subject to great uncertainty and judgment, as any quantitative analysis is based on hypothetical benchmark prices. The results of such analyses tend to be quite sensitive to change in these benchmarks". In the case of a gas mispricing assessment for Ukraine, for example, the authors consider that cost recovery estimation is not appropriate and employ as a benchmark the prices at the border with Russia that

Itera charges on its gas exports to Ukraine. For the electricity sector, they use cost recovery level for two different consumer groups: industrial users and households, because transmission costs for the former are lower than for the latter due to the use of a more efficient high-voltage grid. The benchmark prices were taken from the World Bank estimates for such consumers in other countries, e.g. from Russia. Saavalainen and ten Berge (2006) use the average cost of production (APC) estimated by the World Bank staff as the measure of cost-recovery tariff. APC is calculated as the opportunity cost of alternative use (export prices, world market import prices, etc) of energy inputs of production (heavy fuel, natural gas, etc). However, such an approach has a drawback as world markets prices may not be appropriate either, since the economy may have an advantage in production of a good, and hence be able to deliver it domestically at lower prices (Tchaidze, 2007). In addition, it is not clear what international prices should be used (e.g. on the border with Russia, EU or some other place). Moreover, APC does not include or take into account extended reproduction of capital and is therefore estimated below long-term marginal cost (LRMC). One should note that the measurement of the necessary investment needs for future capacity expansion is a complicated task.

Thirdly, due to unavailability of information there is a lack of estimates for QFAs related to non-cash payment and government guaranteed borrowing to energy companies for CIS countries. The only paper dealing with this issue is by Vinhas de Souza and Catrinescu (2006). Therefore, two methodologies for QFAs in the energy sector cover mispricing of output, arrears at actual prices and excessive output losses.

As was mentioned earlier, Petri, Taube, and Tsyvinski (2002) posit two ways of evaluating QFAs in the energy sector, while Tchaidze (2007) suggests how to properly account for such activity using these two approaches. It should be noted that in these two papers the sub-components of the financial balance approach are slightly different. The summary of these two approaches is presented below.

End-Product Approach

a) Mispricing

If governments in the CIS countries maintain administratively set prices of natural gas and electricity at the levels below the recovery the enterprise incurs additional costs:

$$QFP = (P - P_A)*V, \qquad (1)$$

where *QFP* is a measure of quasi-fiscal activity on account of mispricing; *P* – denotes cost-recovery tariff; *PA* – actual tariff; and *V* – output of electricity or gas.

b) Arrears

If end-users of gas and electricity do not pay for their provision it represents the revenue losses of energy enterprises equal to:

$$QFR = (1 - R)*PA*V, \qquad (2)$$

where *R* is a payment collection ratio, that range from 0 to 1.

c) Excessive losses and theft

Revenue losses due to mispricing and toleration of low bill collection result in inefficiencies (poor maintenance, technical problems in transmission and distribution, inadequate metering or billing practices, etc.) that lead to losses exceeding "normative losses".[51] The extent of excessive losses can be estimated by comparing total losses with values that could normally be expected, e.g. estimates from the countries with a more competitive environment.

$QFL = V*((L\text{-}L_N)/100)$ or $QFL = V*((L\text{-}L_B)/100)$ (3)

where L denotes total losses L_n – normative losses, L_b – benchmark losses (market economy estimations). Losses are estimated as a percent of production.

In sum, total quasi-fiscal activity can be expressed as:

$QFA = QFP + QFR + QFL$ (4)

Financial Balance Approach

If actual revenues of a given energy enterprise are insufficient to cover necessary maintenance expenditures and future capacity expansion, and it does not obtain explicit subsidies from the budget or is not able to borrow, it may resort to an alternative solution, such as running arrears, which would in effect amount to quasi-fiscal activities.

Payment arrears relate to inputs payments not been made in full:

AQ = (1 – RQ)*Q (5)

where Q is the total amount that has to be paid for inputs; RQ – inputs the payment ratio that range from 1 to 0.

In the case of partial payment of taxes, energy enterprises' tax arrears are equal to:

AT = (1 – RT)*T (6)

where T is total amount of taxes that need to be paid, RT – ratio of tax payment that range from 1 to 0.

Future generation arrears or underinvestment into maintenance and replacement of fixed assets or capacity expansion can be expressed as:

AI = (1 – RI)*I (7)

where I denotes the necessary amount of investments, RI – the ratio relation between needed and actual investments that that range from 1 to 0.

Mispricing of inputs in the case when such inputs are energy products (e.g. petroleum) is considered by Petri, Taube, and Tsyvinski (2002) as one more sub-component of QFAs, while Tchaidze (2007) does not take it into account:

MPI = QEI + (PMI – PAI) (8)

where QEI is quantity of energy used as an input, PMI – the market or cost recovery input price, PAI – the actual input price.

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[51] 'Normative' losses are technical waste of production due to transformation leakage.

Total quasi-fiscal activity is equal:

$QFA = MPI + A_Q + A_T + A_I.$

It should be noted that the quasi-fiscal activity concept is different from quasi-fiscal deficit (QFD). For example, in the case of cross-subsidisation, the former may be larger than the latter or they can offset each other. If domestic electricity or gas are sold to households at prices below cost-recovery level, while prices for industrial consumers are high enough to cover this difference, the quasi-fiscal deficit is equal to zero. However, QFAs are obviously present in such a case. There also may be a situation where the quasi-fiscal subsidy to households is equal to QFD, or the quasi-fiscal deficit is smaller than QFAs (Petri et al., 2002).

Macroeconomic implications of QFAs

Affecting the real and financial sides of an economy, QFAs may have significant macroeconomic and microeconomic implications. Subsidised prices of energy products reduce incentives for their efficient use and lead to wasteful consumption. Also, they do not send correct signals to enterprises, undermining their incentives to restructure. Implicit subsidies provided through mispricing support loss-making enterprises and thus divert resources from their most optimal use. On the other hand, as was mentioned above, maintaining administratively set energy prices at a level that does not offset the recovery costs as well as payments arrears of end-users results in under-investments and depletion of the capital stock in the energy sector.

Cross-subsidisation, such as setting energy prices below the cost recovery level for households, at the expense of industrial consumers (who pay higher tariffs), distorts the price structure and erodes competitiveness of enterprises in external markets. In addition, since such a quasi-fiscal subsidy to the population is untargeted it disguises government social policies. For example, as of 2001, quasi-fiscal subsidies to the population in energy and utility services amounted to 20-25% of public cash expenditures on social assistance and social insurance (pensions, social benefits and similar programmes) in Armenia. However, QFAs in the energy sector are a rather inefficient instrument of social policy as well-off households, which consume more energy and utility services, tend to receive more benefits than poorer ones (Freinkman et al., 2003).

If end-users do not pay for gas and electricity, energy sector enterprises may start to run arrears on their obligations towards their suppliers and the budget (tax authorities), and finally become involved in mutual arrears. In this case, central banks or budgets have to provide loans or subsidies to energy enterprises, which may result in high rates of inflation.

Subsidies that government may have to extend to the energy sector in order to resolve problems with payment arrears and heavy debt accumulation typically increase budget vulnerability. Besides, budget revenues and fiscal stance can be negatively affected by the tax arrears of the energy sector. For example, after an increase in import gas prices in Ukraine, the tax arrears of Naftogaz (which was not allowed to immediately raise consumer prices) amounted to 1% of GDP in 2006 (IMF, 2007).

In general, QFAs in the energy sector create lack of transparency and distort the picture of the government's true fiscal position, which may cause inappropriate fiscal policies.

In some CIS countries, payment arrears in the energy sector and energy subsidies have been financed by accumulating external public debt, thus worsening the external sustainability position and possibly impeding access to international capital markets. For example, according to Moldovagaz, on January 1, 2006 accumulated gas debts to Gazprom, *excluding fines and* *penalties,* was roughly 23% of the 2005 Moldovan GDP (Vinhas de Souza and Catrinescu, 2006). In Ukraine, Naftogaz accumulated net foreign liabilities of about 0.5% of GDP. While the government did not provide explicit guarantees for this debt, the request for at least one credit in 2006 was supported by an official comfort letter (IMF, 2007). In 2007, Ukrainian RosUkrEnergo AG (see Ukraine country background note for more information on the company) had USD 2 billion in debts to Gazprom, which was paid using gas from a Ukrainian underground storage facility (USD 1.2 billion) and partly from current assets (USD 929 million). After a gas price hike in 2007 the Belarussian government approached Russia several times with the request for a USD 1.5 billion loan for stabilisation purposes.

There are various other adverse effects of QFAs worth mentioning, e.g. poor maintenance, technical problems in transmission and distribution are dangerous for the environment and may lead to ecological catastrophe; toleration of arrears can result in spreading of non-payment practices to other sectors and create moral hazard problems, poor quality of energy and the utility system, decreasing the living standards of the population (Freinkman et al., 2003).

4.5.3 Evidence on the scale of energy-related QFAs in CIS countries

QFAs can take various forms depending on the sector. For example, in the case of oil and coal they relate to selling them domestically below export parity prices. In a case where prices of oil or coal do not cover domestic costs, it will also involve QFD (apart from QFA). However, for the reasons of limited data availability, our analysis is limited to the electricity and gas sectors and to assessment of QFA rather than QFD. In the utility sector (e.g. heating) it is methodologically difficult to determine benchmark prices (cost recovery prices) because their estimates are not available. In addition, there is no information on non-payments. However, for oil and coal it is also far from being obvious which prices should be used as a benchmark. The IMF, for instance, applied government subsidies to coal enterprises as a proxy when estimating QFD in the Ukrainian coal sector in 2006.

Bearing these remarks in mind, the following sections examine the subcomponents of QFAs in the electricity and gas sectors based on the end-product approach, i.e. tariff setting, bill collection practices and losses, and provide an overview and estimation of QFA in the CIS countries.

Tariffs-related QFA

Electricity

To secure sustainability of the electricity sector, tariffs should fully recover energy supply costs. In the short-term they should cover the costs of all inputs, cash operation and maintenance. In the medium-term, tariffs are also expected to provide funds needed for rehabilitation of transmission and distribution systems (including installation of meters). In the long-term, tariffs should finance the investments required to meet increasing demand for electricity. Besides, the residential tariffs should be higher than average tariffs for all other consumers, as the former get electricity through more expensive low-voltage lines.

CIS electricity tariffs usually involve two types of QFA: the prices for all consumers are set below the cost recovery level and commercial users cross-subsidise households. By 2003 tariffs in many CIS countries did not cover even the short-term costs of energy enterprises. The IEA estimated that subsidies amounted to 42% of the electricity price in Russia in 1998, while in Kazakhstan it was 56.6% (IEA, 1999). In 2002, the average tariff for Russian industrial consumers was set at the level of USD 0.021 per 1 kWh, and for households at USD 0.015 (in

OECD countries USD 0.048 and 0.09, respectively) (Ahrend and Tompson, 2004). By 2003 only Moldova set its electricity tariffs for consumers properly, i.e. the average end user tariff covered the cost recovery level; in Armenia, Belarus and Kazakhstan the prices were almost at this level, while mispricing in Tajikistan and Uzbekistan was the highest.

In 2004-2007, many countries increased their electricity prices. However, due to social (political) considerations, households tariffs were raised less than those for industry, preserving cross-subsidisation. For example, among the four European CIS countries presented in table 4.5.1, in 2007 only Russian households' tariffs were almost equal to the average industrial rate, whereas Belarus, Moldova and Ukraine imposed a quasi-fiscal tax on industrial consumers. Among other countries, Armenia can be considered a positive example – its prices for households have been above those for industry since 1999.

Table 4.5.1 Electricity tariffs, US cent per kWh

	Average households' tariff		Average industrial tariff		Ratio (average households' tariff to average industrial tariff)	
	2005	2007	2005	2007	2005	2007
Belarus	3.3	5.2	6.0	10.6	0.6	0.5
Moldova	5.8	7.3	5.8	8.7	1.0	0.8
Russia	3.5	4.3	4.2	4.5	0.8	0.9
Ukraine	2.3	5.8	3.6	7.2	0.7	0.8

Source: Evans (2006). For 2007 – own calculations based on different internet sites.

Table 4.5.2 Electricity tariff levels for households, US cent per kWh

	2004	2005	2006
Azerbaijan	2.0	2.2	2.2
Armenia	4.5	5.4	5.9
Belarus	3.3	3.5	4.1
Georgia	4.7	5.2	-
Kazakhstan	3.0	3.1	-
Kyrgyzstan	1.0	1.2	1.3
Moldova	6.1	6.0	5.7
Russia	3.2	3.9	-
Tajikistan	0.6	0.6	0.6
Turkmenistan	0.5	0.4	-
Uzbekistan	-	2.6	2.9
Ukraine	2.7	2.5	2.6

Source: EBRD (2007).

Tariff policy, first of all for households, is still under strong political influence (social considerations). The lowest tariffs are in Tajikistan, Kyrgyzstan and Azerbaijan, which could be partly explained by their low production costs. The highest tariffs are in Armenia, Moldova and Georgia (the countries who are among the best electricity sector reform performers). In 2004-

2006, both industrial and residential tariffs increased at the same pace, therefore countries did not achieve considerable improvement in reduction of cross-subsidisation.

Gas

Tariff (price) policy for gas has been characterised by the same drawbacks as in the electricity sector. The IEA estimates that in Russia in 1998 subsidies amounted 42% of the gas price, in Kazakhstan 55.7% (IEA, 1999). In 2000, Russian internal prices amounted to only 25% of the average world market price and were far below long-term marginal costs. In 2003, on average, Gazprom received USD 131.6 per 1 tcm in Europe, USD 43.6 in CIS countries and USD 21.8 from domestic sales. In 2006, Gazprom sold its gas to Europe at an average of USD261.9 per 1 tcm, the prices for CIS varied from USD 47 in Belarus to USD 110 in Georgia and Moldova, while domestic prices were around USD 45.

In many countries, average residential tariffs were lower than industrial tariffs; although the situation was not as bad as with electricity tariffs (Table 4.5.3). In 2007, in Armenia, Georgia, tariffs for households was 1.8-fold higher than that for industry. Armenia, Georgia, Kyrgyzstan, Belarus and Moldova were among the countries where end users' tariffs exceeded or almost reached cost recovery level, while Kazakhstan, Russia and Azerbaijan were lagging behind.

Table 4.5.3 Gas tariffs in selected CIS countries, USD per tcm

	Average Residential tariff, 2003	Average industrial tariff, 2003	Cost recovery, 2003	Level of cost recovery by average end user tariff, 2003	Ratio (average household / industrial tariff), 2003	Residential tariff, end of 2006	Industrial tariff, end of 2006	Residential tariff, end of 2007	Industrial tariff, end of 2007
Armenia	60.58	79.10	58.0	1.29	0.77	200	146	280	153
Azerbaijan	7.30	48.17	25.95	0.85	0.15	37.5	-	37.5	83
Belarus	42.20	42.70	46.90	0.91	0.99	57 (94)***	75	60 (100)	120
Georgia	123.19	78.80	65.0	1.42	1.56	200	160	300	170
Kazakhstan	-	-	62.0	0.69	-	-	-	-	-
Kyrgyzstan	69.51	83.79	65.47	1.19	0.83	-	110	130	165
Moldova	72.24	77.95	72.8	0.97	0.93	180	130	214 (267)*	223
Russia	22.70	22.57	38.0	0.84	1.01	45	47	58 (67)**	54
Tajikistan	56.65	-	63.74	-	-	136	163	198.5	198.5
Ukraine	60.89	42.99	62.50	1.28	1.42	81 (88)**	128	96 (105)**	140
Uzbekistan	21.17	-	25.0	-	-	-	-	-	-

Notes: for industries – without VAT, other taxes and distribution costs.

* - for consumption exceed 30 cm per month; ** - without meters; *** - for cooking.

Source: World Bank (2006); p. 136, different internet resources for 2006 and own calculations.

In 2004-2007, as a result of a price hike for imported gas, many CIS countries increased gas tariffs for industrial consumers and households (see chapter 3 for a discussion on changes in Russia's export gas prices for the CIS). However, for internal political (social) reasons, energy tariff policies have deteriorated in recent years in many CIS countries, increasing QFA. For example, in Ukraine the government's pricing policy in the gas sector has acted as a barrier for domestic gas producers to become exporters: prices of domestic gas are fixed with the help of the "cost plus" method and the gas itself should be sold primarily to households at below market prices. This arrangement does not permit the companies to afford expansion of gas extraction and leads to stagnating gas production.

Box 4.5.1 State tariff policy for gas in Ukraine

In 2006, natural gas tariffs for households in Ukraine were set at roughly one third of the level for industry, resulting in substantial cross-subsidies for households. According to data from the National Energy Regulating Commission (NERC)[52] of Ukraine, the household gas tariff effective in early 2006 covered only 50% of gas production and delivery costs. According to NERC estimates, the policy of subsidising households by the National Joint-Stock Company Naftogaz Ukrainy led to a 4 billion hryvnas loss per year (about USD 790 million). Besides higher industrial tariffs, such a practice meant that enterprises in the energy complex tend to economise on investment in infrastructure and geological exploration. Following a substantial increase in import gas prices in January 2006, household gas tariffs were increased by 25% only on 1st May 2006, the first increase in several years. From 1st July 2006, tariffs were increased by another 80% (up to USD 78-85 / 1 tcm). The NERC has developed a schedule for gradual increases in household gas tariffs. The gas price for households was planned to be increased by 25% semi-annually to reach an economically sound level by 2008[53]. However, due to political reasons (election campaign) any further price increase was frozen.

Source: Rakova (2006).

Table 4.5.4 Gas tariffs in Ukraine, USD per tcm

	1999	1 Jan 06	1 Jan 06	1 Jan 07
Households with meters	40	35	44	81.4
Households without meters	43.7	38	48	88.8
Budget-financed public organizations	53.1	57.6	72	130
District heating companies	43.5	60.9	77	137

Source: Evans (2006).

In Russia, Gazprom sells gas on the domestic market at wholesale prices regulated by the Federal Tariff Service (FTS). Tariffs for gas are differentiated by price zones. Domestic gas prices in Russia are only around 15-20% of the level at which Russian gas was sold to Germany (43 USD per 1 tcm on average in 2006 vs. USD 262 for European consumers). In September 2007, the FTS for the first time published the gas price calculated according to the net back price (with the same profitability as exports). According to these calculations, wholesale price should be 3.3-fold higher than actual tariffs for industrial consumers in 2007 (table 4.5.5).

In 2004-2006, Russian Gazprom incurred significant losses due to price regulations in the domestic gas market that aggravated the problems of shortage of financial resources for investments. Gazprom has argued for years that regulated prices are below replacement cost

[52] The NERC is an independent regulator in the energy sector in charge of regulating natural monopolies in the power and oil-gas industries and pursuing price and tariff policy in these spheres.

[53] 90% of fuel currently priced at USD 77.8/ 1 tcm without VAT and piping and delivery tariffs is supplied to Ukrainian households from local gas fields, i.e., actually, the price should be higher – USD 80–85/ 1tcm.

levels and contract prices to Europe. As a result, Gazprom's losses from domestic sales amounted to USD 17 billion in 2005 alone (Otkritie, 2007).

Table 4.5.5 Gas tariffs in Russia for different industrial consumers, third quarter, 2007

Price zones	Gas tariff, calculated on the net back formula, USD per tcm	Actual gas wholesale tariff for industrial enterprises USD per tcm
I zone	104.4	31.8
II zone	125.8	38.2
III zone	148.1	45.1
IV zone	166.7	50.7
V zone	160.7	48.9
VI zone	170.4	51.8
VII zone	175.3	53.3
VIII zone	177.1	53.9
IX zone	185.4	56.4
X zone	191.5	58.2
XI zone	198.2	60.3

Source: Otkritie (2007).

Since 2006 internal tariffs for gas in Russia have been slowly increasing. However, they are still lower than tariffs in many CIS countries and the EU. Low prices have hampered the gas industry's ability to finance capital spending and have hurt incentives to increase efficiency. The electricity sector, whose share of total gas consumption amounts to 37%, is one of the main beneficiaries of artificially low tariffs. Therefore, according to Gazprom, the electricity sector received in 2006 a subsidy of USD 6.9 billion (Otkritie, 2007).

Table 4.5.6 Gazprom's average tariffs to selected groups of customers, USD per tcm

	1997	2000	2003	2006
Households	19.2	8.0	15.9	35.9
Industry	46.0	12.2	23.8	47.0
Exports to non CIS	84.2	103.5	128.1	262

Sources: Ahrend and Tompson (2004) and own estimations for 2006 based on the Federal Tariff Service of Russia.

In Belarus, the government has been strongly increasing gas prices for domestic consumers since 2000. During 2000-2003, gas prices for households were growing much faster than consumers' prices. The government began the process of reducing cross-subsidisation of households by industry in 2000 when gas prices for consumers began to rise. The increase was particularly considerable in 2000 and 2002 (in 2001 – the year of presidential election - the increase was much less pronounced). For example, in 2000 prices were increased almost 11-fold, whereas in 2001 by only 68 % (this directly results from the fact that until 1999 prices were set at extraordinarily low level). Between 2000 and 2003 gas prices for households were raised 83 times, and electricity tariffs 21 times, while the CPI increased "only" 5-fold. These changes eliminated cross subsidisation of households by the industrial sector in 2003, although after 2004 the situation worsened somewhat again. According to information provided by the Ministry of Economy, tariffs covered 107% of its costs by the end of 2003. However, in 2004, due to an increase in the gas price, household subsidising came back again.

After 2004 cost coverage has stayed at the more or less the same level. However, the Belarusian Ministry of Energy and Ministry of Economy made different estimations of the level of cost coverage for households in the energy sector. According to Ministry of Economy assessments, in January 2007 the cost coverage ratio for natural gas was 157%, whereas the Ministry of Energy put it at 115%. Such a discrepancy was observed in evaluation of electricity tariffs as well. The Ministry of Energy assessed these tariffs for households as staying 7% below the cost recovery level, while the Ministry of Economy estimated the level of coverage at 115%.

Collection rates

Solving the non-payment problem and tightening payment discipline were the key issue in CIS countries for improving the financial state of energy enterprises and reducing QFA in the sector. At the beginning of the 1990s, the governments of all CIS countries were reluctant to impose hard budget constraints on large industrial enterprises. Initially, soft budget constraints were provided directly through budget and monetary policies. The problem was aggravated as legislation in all CIS countries did not allow any disconnection of physical persons and enterprises from provision of energy and utility services for a long time. As a result, in the mid-1990s the collection rates in many countries amounted to 2-40%, with cash collections even lower. Payment arrears, barter and money surrogates became a part of the economy. Energy enterprises were unable either to force the bankruptcy of their debtors or to cut off supplies.

Table 4.5.7 Collection rates in electricity in CIS countries %

	2004	2005	2006
Azerbaijan	27	26	-
Armenia	99	101	99
Belarus	101	100	101
Georgia	-	71	90
Kazakhstan	-	-	-
Kyrgyzstan	76	86	74
Moldova	96	98	96
Russia	-	-	-
Tajikistan	85	74	96
Turkmenistan	-	-	-
Uzbekistan	-	60	54
Ukraine	-	99	100

Source: EBRD (2007).

As result of such a policy, by 1997-1998 only part of energy delivery was actually paid in CIS countries. For example, in 1996 the electricity sector collection rate in Russia and Ukraine stayed at 70% and 86%, respectively (cash payment at only 16% and 20% of the total). On average, in the energy sector of Russia, Belarus, Ukraine, Armenia, Moldova or Azerbaijan only 15-20% of energy supply was paid by cash, 60-65% by quasi money (tax offsets, bonds, barter), while the rest was not paid at all (OECD, 2004; IMF, 2002 and 2007, World Bank, 2006). This combined led to an increase in tax arrears of the energy enterprises and decapitalisation of their assets and infrastructure.

However, such a situation could not last forever. In Russia payment discipline improved after the financial crisis of 1998 and by 2002 the collection rate had reached 100% and payments became executed almost entirely in cash. In other CIS countries the situation improved as well. In 2006, the collection rate in the electricity sector amounted to 26% in Azerbaijan, 90% in Georgia, 74% in Kyrgyzstan, 96% in Tajikistan and 54% in Uzbekistan. In Belarus and Ukraine it exceeded 100% in 2004-2005. Non-payments or payments through barter and tax offsets are still a problem in Central Asian countries, Azerbaijan and Georgia (World Bank, 2006).

Despite the progress in collection of current bills, the electricity sector faces a problem of past arrears, which in many countries may equal or exceed current annual sales.

The situation in the gas sector was more or less the same. Non-payments for consumed electricity often did not allow electricity companies to pay for the purchased gas. For example, Gazprom had problems until recently in collecting payments from Russian customers, who owed USD 2 billion to the gas company in 2005. In many countries (Georgia, Armenia, Moldova, etc.) inability to pay for imported gas led to foreign takeovers of energy and other companies (debt-to-equity swaps).

Nevertheless, in recent years the situation has improved considerably and in most CIS countries collection rates for natural gas have stayed above 90% (with the exception of Georgia and Armenia, where collection rates amounted to 25% and 53% accordingly) (World Bank, 2006).

Losses

Losses in energy distribution constitute another potential channel of QFA, and these indeed play a role in the CIS. Part of the losses have a technical character, caused by aging and depleted infrastructure, the outdated design of many facilities and lack of investments in transmission and distribution networks. Another part has a commercial character, arising from two sources. The first is the use of norms of consumption by households in the absence of meters for measuring actual consumption. About 10% to 15% of electricity, 20-25% of gas and almost all heat provision goes to consumers who do not have installed meters and whose consumption is accounted on the basis of benchmarks or “norms” (World Bank, 2006). The second source is related to theft through bypassing or tampering with meters, collusion with employees of utility providers to obtain illegal connections, understatement of meter readings, etc. To illustrate the potential importance of this factor, theft levels in excess of 20% of total electricity consumption have been reported in Georgia and Kyrgyzstan (World Bank, 2006).

In Georgia, despite all reform efforts, losses remained at around 55% until 2004. In Kyrgyzstan, losses increased from 12% in 1990 to 33% in 2001 and 44% in 2004 (World Bank, 2006). According to Belenergo’s Annual Reports, the level of losses in Belarus in 2003-2005 stayed at around 12.7% of gross consumption mainly due to commercial losses and inappropriate billing practices (weakness in billing coverage) and the absence of meters for measuring actual consumption.

Gas sector losses in the CIS are higher than in CEE or OECD countries (where only 1-1.5% of losses is considered as a norm). In 2004, a high level of losses were reported in Georgia (28%), Armenia (19%) and Tajikistan (11%) (World Bank, 2006).

Estimation of QFA in CIS electricity and gas sectors

Calculating the exact size of QFA is not an easy task. This sections attempts to put together various existing estimates. One important observation is that the levels and dynamics of QFAs varied greatly among CIS economies. For example, in Uzbekistan QFAs amounted to around USD 2.2 billions or 19% of GDP in 2002 (World Bank, 2003). The annual amount of explicit and implicit fiscal subsidies in Armenia reached USD 141 million in 1995 – roughly 11% of GDP.

Thanks to comprehensive market reforms in the sector, these were reduced to USD 33 million in 2002 and only USD 5 million in 2004 (Sargsyan et al., 2006). Progress in reducing QFA in 2000-2003 was quite impressive in Moldova, Belarus, Russia and Kazakhstan. In turn, Tajikistan and Uzbekistan had the highest QFD and, according to IMF estimations, these increased further in this period.

Table 4.5.8 QFD in selected CIS countries in 2002, % of GDP

	QFD		Electricity		Gas sector	
	IMF	WB	IMF	WB	IMF	WB
Armenia	0.6	1.11	1.1	1.0	-0.5	0.1
Azerbaijan	11.6	9.2	9.8	8.1	1.8	1.1
Georgia	5.7	7.7	5.5	6.4	0.2	1.2
Kyrgyzstan	12.2	n.a.	12.0	19.0	0.2	n.a.
Moldova	4.2	4.0	3.3	3.2	0.9	0.8
Tajikistan	22.7	Na	21.4	22.9	1.3	n.a.
Ukraine	8.4	6.6	5.3	5.6	3.1	1.1
Uzbekistan	26.6	19.3	15.9	13.4	10.7	5.9

Source: World Bank (2006) and Saavaleinen and ten Berge (2006).

Table 4.5.9 Implicit subsidies in the electricity sector (% of GDP)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Armenia	10.7	8.0	7.1	4.2	3.1	1.42	2.19	0.96	1.00
Azerbaijan	18.0	12.0	8.9	9.4	10.9	11.4	10.1	8.11	6.42
Belarus						2.51	2.22	0.75	negligible
Georgia	8.5	8.5	7.4	7.9	10.1	12.21	6.85	6.45	5.97
Kazakhstan	6.4	4.3	3.1	-0.6	2.5	3.31	2.87	2.43	1.33
Kyrgyzstan						18.64	25.23	19.02	9.16
Moldova						10.84	7.66	3.20	2.71
Russia						5.36	3.36	3.4	1.01
Tajikistan						28.18	24.95	22.95	16.53
Ukraine						9.08	6.81	5.56	4.03
Uzbekistan						8.55	10.16	13.4	12.06

Source: World Bank (2006).

It should be mentioned that estimations of QFA or QFD vary significantly even for the same country due to the use of different approaches, methodological problems (e.g. determination of benchmark or cost recovery prices) and unavailability of reliable data. For example, the IMF estimated QFA in Tajikistan in 2001 at 5.5% of GDP, while according to the World Bank it amounted to 25% in the electricity sector only (IMF, 2003). The differences between IMF and World Bank estimations of QFDs in 2002 are presented in Table 4.5.8.

According to both the World Bank and IMF estimations, QFA in the electricity sector were significantly larger than in the gas sector. This appears quite intuitive as electricity and heating consumed almost 2/3 of gas supply, while the rest was directed to final consumption, of which 10 -15% was industry. The highest amounts of implicit subsidies in the electricity sector were recorded in Tajikistan, Kyrgyzstan and Uzbekistan (Table 4.5.9). Despite a reduction of such subsidies in comparison with the previous period the estimations of QFA for 2003 amounted to about 23, 19 and 13% of GDP, respectively, mainly on account of low collection rates and excessive losses in Kyrgyzstan and Uzbekistan and mispricing in Uzbekistan and Tajikistan. Belarus, Kazakhstan and Russia demonstrated the lowest rates of QFA in the electricity sector.

QFA in the gas sector was the highest in Uzbekistan, Kazakhstan and Georgia. In Uzbekistan such activities increased markedly and amounted to 8.5 % of GDP in 2003 mainly due to setting tariffs below cost recovery level, cross-subsidisation and low collection rates. In other CIS countries QFA was around 1% of GDP (Ukraine) or less (Table 4.5.10).

Table 4.5.10 Implicit subsidies in the gas sector (% of GDP)

	2000	2001	2002	2003
Armenia	0.38	0.19	0.15	0.48
Azerbaijan	1.4	1.19	1.09	0.89
Belarus	1.92	1.99	1.26	0.46
Georgia	0.95	1.95	1.25	2.34
Kazakhstan	Na	Na	Na	2.15
Moldova	0.77	0.63	0.76	0.92
Russia	1.18	0.92	0.74	0.98
Ukraine	3.72	5.09	1.06	1.03
Uzbekistan	2.95	3.36	5.95	8.45

Source: World Bank (2006).

The importance of various mechanisms in determining overall QFA varies between countries (Petri et al., 2002). For example, in the electricity sector, for such countries as Kyrgyzstan, Tajikistan, Ukraine and Uzbekistan, underpricing was the main factor. For Armenia, Azerbaijan and Georgia non-payments constituted the main problem. In Kyrgyzstan, Moldova and Armenia losses in the networks played an important role.

Current level of QFA

The estimations of QFA presented above dated back to 2002-2003 and ended in 2004 mainly because in this period the IMF undertook analysis of energy sector conditionality included in the IMF financial agreements with CIS countries. In addition, the World Bank within the framework of energy sector reform projects addressed the issues concerning tariff and billing reform. The most recent trends in resolving the problem of implicit subsidies in the energy sector are presented in Table 4.5.11. The table shows that most of the analysed countries reduced the incidence and size of quasi-fiscal activities, however, due to lack of information it is impossible to assess this progress in a precise quantitative manner.

The significant increases in prices of natural gas sold by Gazprom to other CIS countries during 2006-2007 (see chapter 3 for discussion) posed new challenges to domestic energy markets in these countries. The reluctance to pass through all the increases to final consumers meant that after the gradual reduction of QFA in the earlier period, they increased again in some countries. For example in Ukraine, according to IMF assessments, the tendency was for QFA shrinking in 2003-2005, when it declined from 2.25% of GDP to about 1.5 % of GDP, due to improvements in payment discipline and reduction of mispricing being reversed in 2006, and QFA increased to 2%

of GDP. In 2007, QFD for the energy sector as a whole may have risen to 3.8% of GDP and could reach 4.3% in 2009, mainly because of the delay in tariff adjustment to the import price hike, and deterioration of bill collection (IMF, 2007).

Table 4.5.11 QFAs in the CIS energy sector as of 2006 – an overview

	Cross subsidization	Mispricing	Non-payment and arrears	Others, including excess losses	QFA: 2006 to 2002
Armenia	Cross subsidisation was almost eliminated	Tariffs covered costs	Bill collection was almost 100%	There were further reduction of losses	Virtually eliminated
Azerbaijan	Cross subsidization of households	Tariffs for households and industry were below cost recovery level (covering around 85%). In 2007, electricity prices for industrial consumers rose threefold and gas prices twofold. However, state energy enterprise “Azerenergy” has been subsidized.	Collection rate was around 50%	Losses remained the same, around 5% in electricity and 15% in the gas sector	Remained almost the same, around 9% of GDP
Belarus (2007)	Tariffs for industrial users are kept at cost recovery level while household electricity price was 50% or less of the industrial average	Mispricing of electricity and gas for households. Some industrial enterprises got electricity at privileged prices.	Collection rates are around 100%	Losses unchanged from the past (around 12.7% of gross consumption in electricity). Taking into account the depreciation of capital assets in the energy sector (above 64%), mispricing will hamper the renovation of fixed assets leading to even higher losses in the future	Electricity and gas sector implicit subsidies in Belarus were around 2.4-3.4% of GDP

	Cross subsidization	Mispricing	Non-payment and arrears	Others, including excess losses	QFA: 2006 to 2002
Georgia	In 2006-2007 electricity tariffs were substantially increased. Subsidies provided to households below the poverty line. However, cross-subsidisation was still in place	Cost recovery ratio increased to almost 100%.	Bill collection has improved especially in electricity and reached 90%.	Losses remained the same, 5% in electricity, around 12% in gas sector	QFAs reduced
Kazakhstan	Electricity was sold at above-cost recovery level for commercial consumers and below-cost recovery for households	Average cost recovery ratio for end-users was around 100%	Bill collection has been improving	Losses remained the same	QFAs reduced
Kyrgyzstan	Households received electricity and gas at below-cost recovery level	Cost recovery ratio in electricity for households is still very low (0.48%)	Collection rate increased	Losses remained very high by international standards	QFD reduced from 7.5% of GDP in 2005 to around 5.4% of GDP in 2006
Moldova	Cross-subsidisation was eliminated. However, government still subsidise some groups of households (socially vulnerable)	The government increased the electricity tariffs proportionally to the rise of the import prices. Cost recovery ratio is almost 100%.	Collection rate increases and was above 80%	Losses remained high in electricity sector	QFAs declined. In gas sector decreased from 3.8% in 2004 to 3.4% in 2005. In electricity - around 0.05% of GDP in 2005.
Russia	Cross subsidisation continues	Mispricing remained in electricity and gas sector but was reduced slightly. In December 2006 government adopted the plan of full liberalization of electricity and gas prices by 2011	Bill collection has been improving	No estimates available	QFAs declined
Tajikistan	Cross-subsidisation continues	Tariffs were well below cost recovery level. The government approved the schedule of electricity and gas tariffs increase for 2007-2011	Collection rates increased, but the level was still very low.	Losses remained the same as previously	QFAs remained almost the same 22% of GDP mainly on account of electricity sector

	Cross subsidization	Mispricing	Non-payment and arrears	Others, including excess losses	QFA: 2006 to 2002
Ukraine	Cross-subsidisation continues	Mispricing in gas sector of 0.7% of GDP; in electricity sector there was no QFAs on account of mispricing	Payment arrears in electricity sector of 0.5% of GDP; in gas sector of 1% of GDP.	Losses in gas sector 0.4% of GDP	QFD amounted to 0.6% of GDP in electricity sector and 2% in gas sector
Uzbekistan	Cross-subsidisation continues	Cost recovery ratio increased up to 70% due to significant increase in tariffs	Collection rates improved	No information available	QFAs declined to around 19% of GDP

Source: various IMF country reports, EBRD Transition Report 2007, own assessments.

Belarus experienced an expansion in QFA mainly on account of mispricing and an increase in cross-subsidisation not only between households and industrial consumers but within industry by the formation of a privileged group of enterprises that buy energy or gas at a below-cost recovery level. For example, in 2006 industrial users who had a tariff for electricity well above cost recovery level, paid an implicit tax and cross-subsidised retail users and agriculture. In turn, households received a quasi-fiscal subsidy equal to 0.9% of GDP, while for agriculture it was 0.6% of GDP. According to WB estimates, gross electricity and gas sector implicit subsidies in Belarus were reduced to below 0.5% of GDP in 2005. However, our calculations shown that QFA in the energy sector was sizable and reached 2.4-3.4% of GDP in 2006, mainly caused by mispricing in the electricity sector (Table 4.5.12). Taking into consideration the fact that after the gas price hike in 2007 the cross-subsidisation in electricity went up, a further increase in QFAs is most likely.

Table 4.5.12 Quasi-Fiscal Activity in the Belarusian Energy Sector (in % of GDP)

	Mispricing	Arrears	Losses	Total
Electricity	1.5-2.5[54]	-	0.8	2.3-3.3
Gas	0.1	-	n/a	0.1
Gross QFA	1.6-2.6	-	0.8	**2.4-3.4**

Source: Tochitskaya (2007).

Thus, those CIS countries that implemented reforms, e.g. Armenia, Georgia, Kazakhstan, Moldova and Russia, reached the most impressive results in reduction of QFA or even virtually eliminated them. However, one of the main objective of these reforms, i.e. increasing efficiency of the energy sector by bringing energy prices in line with market-based pricing, has not been reached yet. Most CIS countries still have privilege tariffs for selected customers (see Chapter 6 for discussion), which means continuous cross-subsidisation and QFA.

54 Depending on the source of cost recovery data, i.e. the Ministry of Economy or the Ministry of Energy.

Box 4.5.2 Electricity tariff reform in Russia

Russia plans to implement some market reforms in its electricity tariff policy. However, compared with EU countries, such measures seem to be partial and rather moderate.

In May 2008 the government agreed on 25% annual rise for household electricity sales. Earlier plans indicated that by 2015 electricity would cost US cents 8-9.8 per 1 kWh for households, by 2020 – 11-15 US cents, i.e. a planned increase of 2-3-fold. The Ministry of Economic Development and Trade plans that from 2011 household tariffs will exceed tariffs for industries (reaching 150% of the level for industrial consumers by 2020).

Since January 2007, 5% of generated electricity has been traded on the free market, later this share is being increased to 10%. By the end of 2008 up to 30% of all electricity will be traded at market prices (without state regulation). However, for households (12% of all consumption) price regulation will be continued (therefore, there will still be cross-subsidisation).

Source: Various Russian internet sources.

In addition to this problem, some CIS countries, including Russia, have expressed an intention to raise their domestic prices to the European level (barring transportation costs). Given that mispricing is the major contributor to QFA, such a step may imply their actual elimination. In addition, the success of energy price liberalisation in Russia may positively influence energy reforms in other CIS countries.

Box 4.5.3 Liberalisation of gas prices in Russia

In November 2006, the Russian government approved a programme to gradually increase gas prices to market levels, with increases of around 15% in 2007, 2008 25%; 2009 27.7%; 2010 27.7%. Under this programme, the Federal Tariff Service will stop setting caps on Gazprom's prices for industrial consumers in 2011 and for residential consumers in 2013. In May 2008, a 28% increase for the wholesale gas market was agreed rising eventually to a jump of 40% in 2011. It is planned that domestic gas prices will double from current levels to just over USD 100 per tcm in 2010, but this would be still much less than current European export prices.

The establishment of a gas exchange in Russia, where up to 10 bcm is being sold at unregulated prices, 50% by Gazprom and 50% by independent producers, is an important step towards more market-based pricing in Russia’s domestic gas market. Prices on the gas exchange have been as high as USD 94 per tcm compared to regulated gas prices of about USD 40-50 per tcm.

Sources: Vahtra (2005); Ahrend & Tompson (2004), Otkritie (2007) and Financial Times, 6 May 2008.

4.5.4 Conclusion

In all CIS countries artificially low domestic energy prices have been retained for years. Coal, electricity and gas have been supplied to customers, mainly to households, at either below cost or at below market prices due to state regulation. Non-payments and barter schemes have followed under-pricing, turning the energy sector (excluding extraction) into debts and arrears (towards state budgets and foreign energy suppliers, notably Russia). QFA has turned out to be a very serious problem on both the macro and micro levels. At the macro level it has hampered and distorted financial flows and macroeconomic stability, posing an additional burden on budgets and in some cases leading to rising foreign indebtedness. At the micro level, the energy sector in every CIS country needs considerable investments and the private sector is not eager to come in due to state price regulations. The energy sector deficit has been financed primary through direct government subsidies, default on payables, the depletion of existing energy sector assets and poor quality of service to customers.

More recently, several CIS economies have initiated policy changes and reforms that have considerably improved the situation. In some countries (e.g. Belarus, Ukraine) the threat to give away property to Russian monopolies ("assets for debts scheme") have turned out to be a sufficient stimulus for toughening payment discipline, elimination of non-cash schemes, paying back external debts and gradual increases of internal prices. In other countries (Georgia Moldova, Armenia) the problem of debts and low tariffs has mainly been resolved with liberal market reforms and attraction of FDI. Reform efforts in the energy sectors of Central Asian countries are still insufficient.

Despite progress in energy sector performance, elimination of quasi-fiscal activities in most CIS countries is still quite far from the finished. QFA remains a limitation and obstacle for the sector's development. IMF and World Bank estimations show that QFA ranged from 0.6-2% of GDP in Belarus, Armenia, Moldova, and Ukraine to 23-27% in Tajikistan and Uzbekistan in 2006-2007. Our analysis confirms that mispricing, cross-subsidisation and a low level of bills collection have been the main contributors to energy sector QFA. Secondly, quasi-fiscal activities and deficits tend to be higher in the electricity sector, in some countries (Tajikistan) reaching 22-23% of GDP, while the highest QFD in the gas sector did not exceed 10% of GDP (Uzbekistan). One of the reasons is a considerably smaller size of the gas sector. Thirdly, external pressure and lack of own energy resources appear to be the most effective mechanisms enforcing serious reforms (the examples of Armenia, Moldova), while energy-rich countries (Azerbaijan, Uzbekistan) have lagged behind in addressing quasi-fiscal imbalances because export earnings from oil and gas sales have allowed them to compensate losses from non-payment and mispricing. Fourthly, limited progress in general energy reforms implies that a reduction or elimination of QFA, even if achieved, can be easily reversed. As was shown by the Ukrainian experience, external energy shocks in the form of increased gas prices, have resulted in the expansion of mispricing practices, toleration of arrears and have therefore led to an increase in QFA. Thus, elimination of QFA critically depends on energy sector reforms, which should be placed at the centre of the overall reform agenda.

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4.6 Energy and monetary policy challenges

The purpose of this section is to analyse how the central banks of CIS countries have managed inflationary pressures coming from the energy sector boom and how various monetary policy regimes could help to meet this challenge. Our definition of monetary policy is broad, i.e. it includes exchange rate policy in countries where the exchange rate is used as an active policy tool. The same concerns the notion of "monetary regime": this also includes actual exchange rate arrangements (in contrast to formal arrangements, which are sometimes very distant from reality). In the subsequent sub-sections we present an inflation outlook and analyse sources of inflationary pressures, followed by an analysis of money supply dynamics and its major sources, interaction with fiscal policies, demand for money, actual exchange rate policies and arrangements. At the end, we discuss future options in the area of monetary policy and monetary regimes. In particular, we would like to add our contribution to the ongoing debate as to what kind of monetary/exchange rate regime would be optimal for various sub-groups of countries (energy exporters vs. energy importers, big countries vs. small countries) to help them to correctly handle future possible fluctuations in energy prices from a monetary policy side.

4.6.1 Continuing inflationary pressures in CIS and its sources

The empirical analysis in this and subsequent sub-sections covers the period since 1998, when most CIS countries suffered currency crises triggered by unsustainable fiscal/macroeconomic policies in the 1990s and additionally strengthened by the contagion effect of the 1997 Asian crisis and 1998 Russian crisis (for details see Dabrowski et al., 2003). Looking back, this was undoubtedly a turning point in the region's macroeconomic development. After the dramatic experience of 1998-1999, both fiscal and monetary policies have become, on average, more prudent and responsible and inflation has started to fall to single- or low double-digit levels even in the case of persistent high-inflation countries such as Belarus (see Table 4.6.1).

Table 4.6.1 Annual inflation in the CIS, 1998-2007, end of period, in %

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Armenia	-1.3	2.0	0.4	2.9	2.0	8.6	2.0	-0.2	5.2	6.6
Azerbaijan	-7.6	-0.5	2.2	1.4	3.3	3.6	10.4	5.5	11.4	19.5
Belarus	182	251	107	46.1	34.8	25.4	14.4	7.9	6.6	12.1
Georgia	10.7	10.9	4.6	3.4	5.4	7.0	7.5	6.2	8.8	11.0
Kazakhstan	1.9	18.1	9.8	6.4	6.6	6.8	6.7	7.5	8.4	18.8
Kyrgyzstan	16.8	39.9	9.6	3.7	2.3	5.6	2.8	4.9	5.1	20.1
Moldova	18.2	43.8	18.5	6.4	4.4	15.7	12.6	10.1	14.1	13.4
Russia	84.4	36.5	20.2	18.6	15.1	12.0	11.7	10.9	9.0	11.9
Tajikistan	2.7	30.1	60.6	12.5	14.5	13.7	5.7	7.1	12.5	19.8
Turkmenistan	19.8	20.1	7.4	11.7	7.8	3.1	9.0	10.4	7.2	10.0
Ukraine	20.0	19.2	25.8	6.1	-0.6	8.2	12.2	10.3	11.6	16.6
Uzbekistan	26.1	26.0	28.2	26.5	21.6	7.8	9.1	12.3	11.4	11.9

Source: World Economic Outlook Database, April 2008.

To obtain a complete picture of post-1998 inflation and more generally of macroeconomic developments, three important circumstances need to be mentioned, however. Firstly, after a long period of adaptation output decline (sometimes called the "transformation recession"), CIS economies entered a phase of strong economic recovery. Secondly, this trend was enhanced by a rapid increase in prices of energy and other commodities that are very important in the production and export structures of many CIS countries. Thirdly, the first half of the 2000s was marked by unique calm on the global financial markets in an environment of abundant money supply provided by the major central banks' highly accommodative monetary policy in developed countries. All these three circumstances made both fiscal and monetary management in emerging-market economies, including CIS countries, easier – at least during the first few years of the new Millennium. However, in the mid-2000s the same factors started to work in the opposite direction, i.e. generating additional inflationary pressures and narrowing the room for monetary policy manoeuvre.

As demonstrated in Table 4.6.1, the annual inflation rate in 8 out of 12 CIS countries was higher at the end of 2006 than at the end of 2005. In 2007, inflation accelerated even further in all CIS countries apart from Moldova, surpassing 10% in all countries, with the exception of Armenia. This is a part of a worldwide trend caused by the lax monetary policy of the major central banks , as mentioned above, and seriously affecting most emerging market economies.

At first glance, the increasing inflationary pressures in each individual country seem to stem from various sources: increasing energy and commodity prices (including prices of food products), which must affect, sooner or later, domestic price levels of both exporters and importers, the continuous weakening of the US dollar, which is a major transaction currency in energy and commodity trade and which, at the same time, plays the role of "anchor" currency for several CIS currencies (i.e. they are pegged to the USD in one way or another), rapidly growing international reserves, which contribute to domestic monetary expansion, domestic credit expansion and, in some cases, insufficiently tight fiscal policy.

Looking deeper, some of these factors are co-integrated. For example, the weakened US dollar additionally stimulates increases in export volumes and dollar-denominated export prices, and both factors contribute to increasing international reserves. The rapid increase in money supply fuelled by growing currency reserves creates more room for domestic credit expansion. The increase in oil, gas and other commodity revenues improves the overall fiscal position and creates the temptation to expand government expenditures and fuel domestic demand, etc.

In the subsequent sub-sections we concentrate on the factors that are related, in one way or another, to the energy and commodity sector boom to illustrate its influence on monetary policy management.

4.6.2 Rapid increase in international reserves and its transmission into domestic money supply

An increase in production and exports of energy commodities and rapidly increasing international oil/gas prices at the end of the 1990s and the first half of the 2000s radically changed the balance of payments position of oil/ gas exporting countries, resulting, among other things, in rapidly increasing international reserves. In the CIS region this was the case for Azerbaijan, Kazakhstan, Russia and Turkmenistan and, to a lesser extent, Uzbekistan. The same also goes for other basic commodities, for example metals and cotton, which are important export items for Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine and Uzbekistan.

In addition, five other important factors contributed to the rapid increase in international reserves. Firstly, remittances from labour migrants played a prominent role in smaller low-income economies such as Armenia, Azerbaijan, Georgia, Moldova, Kyrgyzstan and Tajikistan, but also played some role in bigger countries such as Belarus, Ukraine and Uzbekistan. Secondly, after a period of an intensive private capital outflows, the direction of net capital movement changed to positive in the mid-2000s in the case of Russia and Ukraine and even earlier with Azerbaijan and Kazakhstan. Part of a gross capital inflow has been related to large foreign investment projects in energy production (Azerbaijan and Kazakhstan) and energy transit (Georgia). Thirdly, some low-income countries (Kyrgyzstan and Tajikistan) continue to receive substantial official aid flows although their scale has decreased compared to the 1990s. Fourthly, at the beginning of the analysed period, i.e. after the series of 1998-1999 currency crises, the IMF pushed developing and transition countries to build up their official foreign currency reserves as a precautionary measure against future speculative attacks. This kind of “mercantilist” policy led not only to an increase in official reserves but also meant that national currencies remained undervalued, which proved to be one of the sources of inflationary pressure when the individual economies became more integrated into the global economy. Ironically, this policy also caused substantial wealth losses for CIS central banks when their dominant reserve currency, the US dollar, started to decline against other major currencies. Fifthly, a period of relative macroeconomic stability and stable or appreciating exchange rates of national currencies in relation to the US dollar (see below) stimulated de-dollarisation of CIS economies, which must have translated into an increase in official central bank reserve assets, other things being equal. However, as cash foreign exchange balances remain immeasurable one cannot estimate the exact scale of this phenomenon.

Table 4.6.2 Gross international reserves, excluding gold in USD billion (end of year)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2006/ 1998 ratio
Armenia	0.28	0.29	0.30	0.32	0.42	0.50	0.55	0.67	1.07	3.8
Azerbaijan	0.45	0.67	0.68	0.73	0.72	0.80	1.08	1.18	2.50	5.6
Belarus	0.70	0.29	0.35	0.39	0.42	0.46	0.69	1.11	1.07	1.5
Georgia	0.12	0.13	0.11	0.16	0.20	0.19	0.38	0.47	0.88	7.4
Kazakhstan	1.46	1.48	1.59	2.00	2.56	4.96	9.28	7.07	19.11	13.1
Kyrgyzstan	0.16	0.23	0.21	0.23	0.29	0.36	0.55	0.57	0.76	4.7
Moldova	0.14	0.19	0.22	0.23	0.27	0.30	0.47	0.60	0.78	5.4
Russia	7.80	8.46	24.26	32.54	44.05	73.18	120.81	175.90	295.57	37.9
Tajikistan	0.07	0.06	0.09	0.10	0.10	0.14	0.19	0.24	0.25	3.9
Turkmenistan	1.38	1.56	1.81	2.06	2.35	2.67	2.71	3.44	5.43	3.9
Ukraine	0.76	1.05	1.35	2.96	4.24	6.73	9.30	19.41	22.30	29.3
Uzbekistan	0.53	0.76	0.68	1.21	1.22	1.66	2.15	2.90	4.67	8.8

Source: EBRD selected economic indicators (as of the end of October 2007)
http://www.ebrd.com/country/sector/econo/stats/sei.xls

As a result of a combination of the above analysed factors all CIS countries apart from Belarus recorded rapid and continuous increases in their gross international reserves, which is well illustrated in Table 4.6.2. Between the end of 1998 and the end of 2006, the increase amounted from almost four-fold in the case of Armenia, Tajikistan and Turkmenistan to almost 38-fold in case of Russia[55]. Indirectly, this indicates the scale of "mercantilist" policies conducted by CIS central banks in response to the pressures exerted by export and protectionist lobbies and the deep undervaluation of some currencies.

The pace of increase accelerated in 2005-2006 and even more in 2007, i.e. beyond the horizon of Table 4.6.2. Table 4.6.3 illustrates changes in official reserve assets between the end of December 2006 and the end of March 2008, according to IMF data[56]. In all countries for which data are available, apart from Kazakhstan (which experienced turbulence in its financial sector), they increased by more than 40% during 2007, typically continuing an upturn in early 2008.

Table 4.6.3 Official reserve assets USD billion (end of period)

Country	Dec 2006	Dec 2007	Mar 2008
Armenia	1.07	1.66	1.60
Belarus	1.38	4.18	4.75
Kazakhstan	19.11	17.39	19.26
Kyrgyzstan	0.81	1.17	1.38
Moldova	0.78	1.33	1.42
Russia	303.73	476.39	506.97
Ukraine	22.36	32.48	33.23

Source: http://www.imf.org/external/np/sta/ir/8802.pdf

Table 4.6.4 Broad money (M2), annual end-of-year change, in %

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006
Armenia	36.0	13.6	39.7	4.3	34.0	10.4	22.3	27.8	32.9
Azerbaijan	-21.7	15.2	15.9	7.7	15.6	27.9	31.9	15.8	168.3
Belarus	276.0	128.7	216.3	66.1	50.3	56.3	44.1	42.2	39.3
Georgia	-1.1	21.0	39.4	18.5	17.1	22.7	42.6	26.4	39.3
Kazakhstan	-14.1	84.4	45.0	40.2	30.1	34.2	68.2	26.3	78.1
Kyrgyzstan	17.5	33.7	11.7	11.3	33.9	33.4	32.1	10.0	51.5
Moldova	-22.0	33.5	38.8	37.8	30.4	24.4	44.7	36.7	12.2
Russia	19.8	57.2	63.8	39.7	32.4	50.5	35.8	38.5	48.8
Tajikistan	34.1	24.6	63.3	35.0	40.5	40.9	9.8	25.9	59.7
Turkmenistan	84.4	21.8	94.6	16.7	1.5	40.9	13.4	27.2	17.7
Ukraine	24.0	40.7	45.3	43.2	42.3	46.9	32.8	53.9	34.3
Uzbekistan	28.1	32.1	43.3	54.3	29.7	27.1	47.8	53.8	36.8

Source: EBRD selected economic indicators (as of the end of October 2007)

55 Part of this increase may reflect valuation changes generated by changes in exchange rates between major reserve currencies. However, lack of data on the currency composition of international reserves makes it impossible to assess how strong this effect was and in which direction it worked.

56 IMF monthly data survey on International Reserves and Foreign Currency Liquidity covers only 7 CIS countries. Some data discrepancies between EBRD and IMF official reserves statistics can be explained by definition differences.

http://www.ebrd.com/country/sector/econo/stats/sei.xls

With limited sterilisation tools in central banks' hands (see below) a rapid and accelerating increase in official reserves had to be translated into a rapid increase in domestic money supply. As demonstrated in Table 4.6.4 the pace of this increase stood at a high two-digit annual level.

Hypothetically, the increase in central bank's monetary base caused by its increasing international reserves can be neutralised in two ways: (i) by negative net credit to government; or (ii) by negative net credit to commercial banks.

The first option is possible either if the government repays its outstanding debt to the central bank or if the latter securitises its claims to the government reselling them to commercial banks in money market operations. According to anecdotal evidence, these kinds of operations were conducted in some CIS countries such as Kazakhstan or Ukraine but their scale could not have been substantial (compared to the scale of official reserves inflow) because of the limited stock of outstanding government liabilities to central banks, inherited mostly from the first half of the 1990s and then depreciated by high inflation.

Fiscal policy can also help monetary policy in other way if it runs a budget surplus. The government can repay its foreign debt, purchasing foreign currency from a central bank or setting aside a special oil stabilisation fund (see Section 4.4), which invests its assets outside the country. This has been the case of Kazakhstan and Russia, which run persistent and substantial fiscal surpluses[57]. However, even in these two countries fiscal policy can provide only partial relief and has not been able to stop a rapid building up of central bank reserves and domestic monetary expansion.

The same conclusions apply to the second sterilisation channel, i.e. decreasing central bank credit to commercial banks. The central banks of Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine started to use sterilisation instruments such as their own certificates of deposits to absorb commercial banks' liquidity. However, the potential scale of these interventions is too small compared to the rapid growth in international reserves. In addition, the increasing size of cross-border capital flows (including short-term financial flows) makes sterilisation increasingly inefficient (i.e. self-perpetuating) and costly.

The increasing money multiplier (as a result of a deepening of financial intermediation) makes things even worse from the point of view of pure monetary arithmetic: broad money grows faster than the monetary base[58]. Apart from the inflationary consequences, this increases the vulnerability of the financial sector as rapid credit growth is usually associated with less prudent lending practices[59].

On the other hand, the increasing demand for money helped to absorb a major part of the fast growing money supply, especially in the first half of the 2000s. As demonstrated in Table 4.6.5, the initial level of monetisation (measured as the share of broad money in GDP), especially in the

57 The third large oil producer – Azerbaijan – also runs a fiscal surplus, which is, however, too small to cushion inflationary pressure.

58 In Ukraine, for example, the money multiplier increased from 1.91 in 2000 to 2.66 in 2006 (UEO 2007 Q2, Table 14, p.51).

59 This kind of increased vulnerability has been recently observed in Kazakhstan.

crisis years of 1998-1999 was extremely low by international standards. This created room for post-crisis remonetisation and deepening financial intermediation when inflation slowed down, the exchange rate stabilised and macroeconomic policy became more prudent and credible. As a result, the ratio of M2 to GDP doubled in Kyrgyzstan, Moldova and Russia, tripled in Georgia and Ukraine, and increased by more than four-fold in Kazakhstan in the analysed period. Progress in other countries looks more problematic.

Table 4.6.5 Broad money (M2) in % of GDP, end of year

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006
Armenia	10.0	11.0	14.7	13.4	15.6	14.4	15.0	16.3	18.2
Azerbaijan	7.1	7.4	6.9	6.6	6.7	7.3	8.0	6.3	12.0
Belarus	30.9	16.4	17.2	15.2	15.0	16.8	17.7	19.3	22.1
Georgia	6.4	7.9	10.3	11.1	11.6	12.4	15.2	16.4	19.3
Kazakhstan	8.6	13.6	15.3	17.1	19.2	21.1	27.8	27.2	36.3
Kyrgyzstan	14.5	13.6	11.3	11.1	14.6	17.5	20.6	21.2	28.6
Moldova	14.9	14.7	15.7	18.2	20.0	20.4	25.4	29.5	28.3
Russia	17.0	14.6	15.8	18.0	19.7	24.3	26.0	27.9	33.8
Tajikistan	7.1	6.7	8.2	7.9	8.4	8.3	7.0	7.6	9.4
Turkmenistan	15.0	12.7	19.4	16.1	13.0	13.9	12.9	13.0	12.7
Ukraine	15.0	16.6	18.5	22.1	28.5	35.3	36.4	43.8	48.2
Uzbekistan	15.4	13.6	12.2	12.4	10.6	10.3	12.2	14.4	15.1

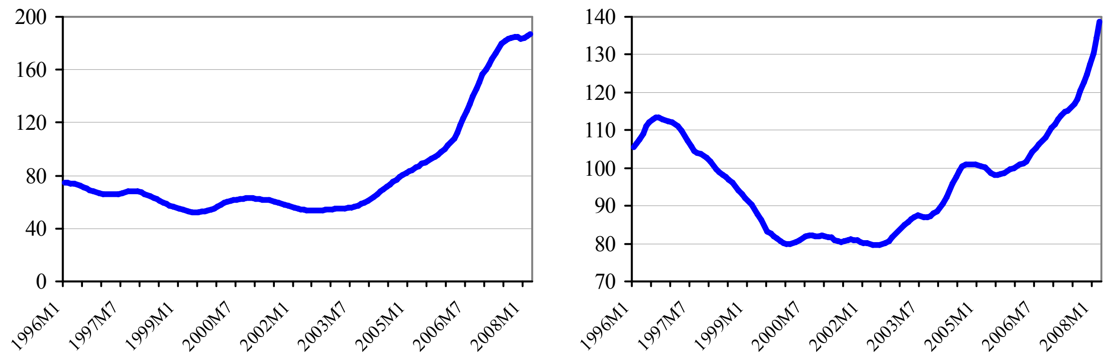
Source: EBRD selected economic indicators (as of the end of October 2007)
http://www.ebrd.com/country/sector/econo/stats/sei.xls

By comparison to Central and East European countries, most of which with monetisation levels in a range between 40% and 70% of GDP, one can claim there is still a large room for further increase in the monetisation of CIS economies, especially those representing a higher level of GDP per capita. However, the question remains open as to how quickly such catching up can safely happen. An increase in monetisation can be exclusively demand-driven and any attempt to accelerate this process from a money supply side involves a risk of higher inflation and perhaps even a reversal of the already achieved progress in this sphere. Increasing inflationary pressures in 2005-2007 provide a clear signal that monetary expansion went beyond the limits determined by increasing demand for money.

4.6.3 External price shocks

Looking at inflation developments in CIS countries from the point of view of external price shocks one notices not only a rapid increase in oil and natural gas prices but also an increase in international prices of other basic commodities, especially metals, which constitute a major export item for many CIS countries. The sharp increase of the composite index of metal prices started after 2003 (see Figure 4.6.1). At the same time the increasing price trend also affected food and other agricultural products.

Figure 4.6.1 Metal price index (left panel) and commodity food price index (right panel), Jan 1996 - Mar 2008 (2005 = 100, 12-month moving average in terms of USD)



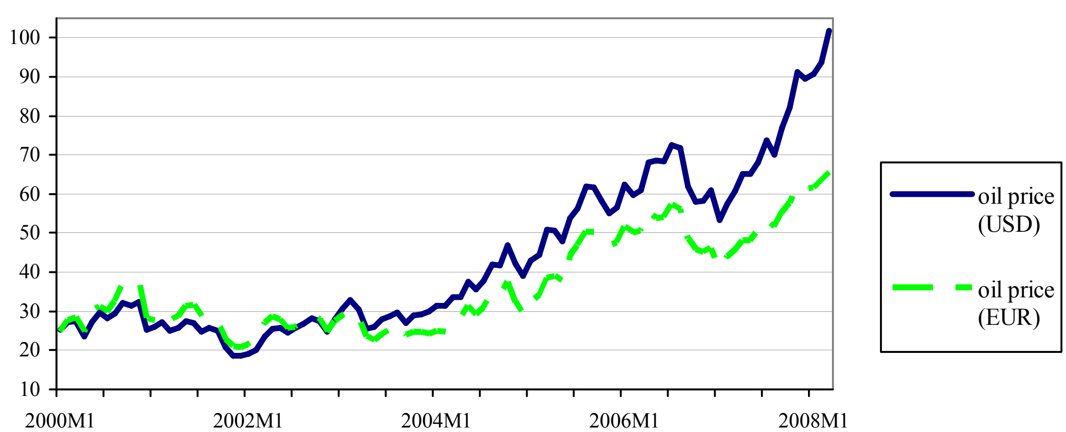
Note: Commodity Metals Price Index, includes copper, aluminium, iron ore, tin, nickel, zinc, lead, and uranium. Commodity Food Price Index includes cereal, vegetable oils, meat, seafood, sugar, bananas, and oranges.

Source: IMF Primary Commodity Price database.

The continuous increase in commodity prices is driven by expanding demand from rapidly growing newly industrialised countries such as China and India. However, part of the increasing global demand has a speculative character and results from the lax monetary policies of major developed countries, particularly those of the US Federal Reserve Board and Bank of Japan, in the current decade. Excessive global liquidity (see Gros, Meyer & Ubide, 2006), historically record-low interest rates and the declining US dollar pushed many investors to move out from dollar-denominated financial assets towards commodity markets (see Cheng and Mercer-Blackman, 2007).

The price shock may be a bit smaller when prices are recorded in currencies other than the US dollar (Figure 4.6.2 reveals much less dramatic recent dynamics in oil prices expressed in euro). However, until very recently, most CIS currencies were *de facto* pegged to the US currency, implying a full transmission of dollar commodity prices into domestic ones.

Figure 4.6.2 Oil prices in USD and EUR, Jan 2000 - Mar 2008



Note: The figure plots simple average of three crude oil spot prices: Dated Brent, West Texas Intermediate, and the Dubai Fateh.

Sources: IMF commodity prices database and ECB.

4.6.4 Exchange rate policies

The series of 1998-1999 currency crises forced most CIS countries to abandon US dollar pegs and allow their currencies to float. However, soon after the crisis all countries de facto re-pegged their currencies, again to the US dollar[60]. The "fear of floating"[61] was obvious and at least partly justified by the fresh memory of very high inflation, or even hyperinflation, and stemmed from the low credibility of domestic currencies and monetary policies, low levels of monetisation (see sub-section 4.6.2) and very high levels of spontaneous dollarisation, including high US dollar cash balances and the dominant role of this currency as a transaction unit. In this context, the choice of the US dollar as the anchor or reference currency seemed to have no real alternative.

In the first part of the analysed period the US dollar peg was able to help CIS countries combat inflation and remonetise their economies at a relatively fast pace (see subsection 4.6.2 and Table 4.6.5). This effect would have been even stronger if it hadn't been for attempts by most CIS countries to try crawling peg devaluations at the beginning of the 2000s (see Table 4.6.6). As usual, such a policy, aimed at appeasing domestic lobbies of marginal exporters - and protectionist sentiments, was counterproductive from the point of view of fighting inflation and stabilising inflationary expectations. Especially if the starting level of exchange rates was substantially undervalued and economies experienced a period of fast productivity growth, both being the case in the analysed group of countries.

Table 4.6.6 Exchange rate, units of national currency per 1 USD, annual average

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006
Armenia	504.9	535.1	539.5	555.1	573.4	578.8	533.5	457.8	416.0
Azerbaijan	0.8	0.8	0.9	0.9	1.0	1.0	1.0	0.9	0.9
Belarus	46	249	877	1,390	1,791	2,051	2,160	2,154	2,145
Georgia	1.4	2.0	2.0	2.1	2.2	2.1	1.9	1.8	1.8
Kazakhstan	78.3	119.5	142.1	146.7	153.3	149.6	136.0	132.9	126.1
Kyrgyzstan	20.8	39.0	47.7	48.3	46.9	43.7	42.6	41.0	40.2
Moldova	5.4	10.5	12.4	12.9	13.6	13.9	12.3	12.6	13.1
Russia	10.0	24.6	28.1	29.2	31.3	30.7	28.8	28.3	27.2
Tajikistan	0.8	1.2	1.8	2.4	2.8	3.1	3.0	3.1	3.3
Turkmenistan	5,130	8,169	8,479	9,828	10,097	10,033	10,375	11,015	10,882
Ukraine	2.4	4.1	5.4	5.4	5.3	5.3	5.3	5.1	5.1
Uzbekistan	132	257	361	646	885	995	999	1,072	1,220

Notes: (1) In case of currency denomination (Azerbaijan, Belarus and Tajikistan) pre-denomination exchange rates were converted into new units. (2) In the case of countries that have had multiple exchange rates (Belarus, Turkmenistan and Uzbekistan), weighted averages were estimated.

Source: EBRD selected economic indicators (as of the end of October 2007)

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60 In contrast to the previous period the re-pegging had a *de facto* rather than a *de jure* character, i.e. formally most of the CIS central banks declared a managed float.

61 We refer here to the seminal paper of Calvo & Reinhard (2000).

http://www.ebrd.com/country/sector/econo/stats/sei.xls

After 2002, when US dollar started to depreciate against the other major currencies, its role as an anti-inflationary anchor seriously weakened. This particularly concerns European and Caucasus CIS countries and Kazakhstan, which have a substantial share of euro-denominated imports. Although most CIS countries abandoned crawling peg devaluation policies and even started to appreciate their currencies against the US dollar (partly as a result of replacing the USD by a currency basket as a peg anchor) this adjustment came too late and was too limited to halt the importing of inflationary pressures through the exchange rate channel (see IMF, 2007, for assessing the sources of inflationary pressure in Russia). The recent round of abrupt depreciations of the US dollar (observed in the second half of 2007 and beginning of 2008) additionally undermines the role of the currency as an anti-inflationary anchor and calls for more radical changes in exchange rate policies and, more generally, monetary policy regimes in CIS countries.

4.6.5 Monetary policy regimes in CIS countries

As discussed in the previous sub-section, most CIS countries have followed a *de facto* exchange rate target, although this cannot be considered a hard-peg monetary regime, i.e. one of the so-called "corner" solutions (see Frankel, 1999), where a country completely gives up its domestic monetary management and fixes its exchange rate forever (or adopts an external currency). Instead, the actual monetary/exchange rate arrangements in CIS countries represent a category of "intermediate" or "hybrid" regime, ranging from fixed but adjustable peg, through various kinds of soft peg to managed float. In such regimes, the monetary authorities try to manage simultaneously domestic liquidity and exchange rates.

Both theoretical and empirical analyses point to deep flaws in such hybrid regimes, confirmed in the most dramatic way by the series of currency crises in the 1990s. In the world of free capital movement, hybrid regimes violate the principle of "impossible trinity", which dictates that a country must give up one of three goals: exchange rate stability, monetary independence or financial market integration (Frankel, 1999). More specifically, these regimes are unlikely to provide the advantages of either extreme: i.e. they are neither able to provide the exchange rate stability associated with a 'hard' peg, nor sufficient discretion in managing domestic liquidity that comes with a free float. On the contrary, intermediate regimes may actually create substantial exchange rate variability (actual or expected when the peg is not viewed as credible), while making the money supply largely exogenous (beyond the control of the monetary authorities). Secondly, regimes with low credibility are technically very difficult to operate because of fluctuating demand for money and changing market expectations. Moreover, short-term economic and political pressures may tempt policy makers to ignore trade offs between the two goals and attempt the impossible feat of stabilising the exchange rate and pursuing discretionary monetary policies simultaneously. Finally, the transparency — and therefore credibility — of intermediary regimes is lower than that of the corner solutions (Dabrowski, 2004).

While a critique of the *status quo* seems to be quite obvious, it is not easy to suggest a positive solution. Immediately after the 1998-1999 currency crises we advocated a hard peg in a number of CIS countries as a way to resolve the above-outlined fundamental contradictions of intermediate regimes (see Dabrowski, 1999 for Ukraine; Dabrowski, 2000 for Kyrgyzstan; Dabrowski, Paczynski and Rawdanowicz, 2002 for Russia). However, the situation has changed since then at least in two respects. Firstly, the credibility of CIS currencies and monetary policies has increased substantially compared to the immediate post-crisis period when they were very low. Secondly, the declining US dollar and obvious contradictions between the international role of this currency and the domestic priorities of US monetary policy questions the rationale for a dollar-denominated variant of the hard peg.

Thus, thinking about a hard-peg corner solution requires the search for another anchor. However, one cannot guarantee that another currency, for example the euro, would not be affected by similar turbulences in the future. A basket of major currencies instead of just one currency may be the solution (see Al-Abri, 2006), which would partly neutralise shocks from rapid changes in cross exchange rates between major currencies. Another unorthodox mechanism – pegging to the export price index – is proposed by Frankel (2005). This solution would probably allow neutralising effects of commodity price changes on terms of trade and the domestic real sector but not necessarily help in stabilising the price level and demand for domestic currency. In addition, all ‘composite’ anchors may be less transparent for domestic money holders and easier to manipulate by policymakers than traditional single-currency anchors.

The opposite side of the spectrum, i.e. direct inflation targeting (DIT), which has been tried successfully in a number of transition and developing countries in the last 10 years and which has been advocated by the IMF in the CIS region (see e.g. Dabla-Norris et al., 2007 in respect to Armenia and Georgia), does not look an easy-to-implement option either. Firstly, it must be connected with abandoning exchange rate management and making national currencies fully floating. This requires, in turn, overcoming the above mentioned “fear of floating”, which may have rational foundations in countries heavily dependent on the production and export of a single commodity/commodity group such as oil and natural gas. If one assumes that periodic fluctuations in commodity prices will continue, they will be transmitted into corresponding fluctuations in nominal exchange rate with all the associated adverse consequences for domestic inflation, demand for domestic money balances and real sector performance. A hard peg with an aggressive fiscal policy buffer such as oil stabilisation fund may be a better solution for such countries. More generally, exchange rate stability seems to be a better solution for small open economies with limited domestic macroeconomic policy credibility.

In addition, adopting DIT requires a lot of preparatory steps (see IMF, 2005, Box 2 in respect to Ukraine; Dabla-Norris et al., 2007 in respect to Armenia and Georgia) such as legal and institutional changes (a high degree of central bank independence from both the executive and legislative branches of government), developing and deepening money and foreign exchange markets, full capital account liberalisation, radical changes in monetary policy operational framework and instruments and developing statistical, analytical and forecasting capacities of both central banks and independent analytical centres. All of these would take time: approximately 2-3 years from the beginning of implementation to their complete adoption.

Nevertheless, this may be an interesting option for larger economies with more diversified export structures, for example Ukraine. If one assumes that energy prices will stabilise on the current high level for a longer period this may be also a good option for Russia and Kazakhstan.

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4.7 Redistribution of oil revenues – the case of Central Asia

As we noted in Section 4.2, when discussing the key lessons for policies that could limit the potential negative outcomes for development of natural resource booms and maximising the benefits, avoiding excessive increases in income inequalities may prove to be an important factor supporting the long-term growth prospects of countries. Therefore, it is important to understand the mechanisms of redistribution of oil wealth and challenges related to redistribution policies. These issues are covered in this section.

Traditional studies of such issue are based on the macro-economic level, underlying price effects. Here, we take a novel approach, looking at the micro-economic effects by analysing household expenditures. The following discussion is based on the contributions on Azerbaijan and Kazakhstan in Najman et al. (2007a).

4.7.1 Studying the effects of an oil boom

Both Azerbaijan and Kazakhstan see their oil wealth as the basis for economic development, so it is crucially important to have a good understanding of the following points:

- What transmission mechanisms turn a resource boom into a curse?
- How are oil revenues redistributed in an oil economy?
- How should redistribution mechanisms be designed to benefit the population?

A fundamental issue is that, due to the capital-intensive nature of oil production, the direct impact on the local economy is likely to be small, and thus attention must also be paid to the indirect effects or to taxation and redistribution of oil rents through the state budget.

An important transmission mechanism linking resource abundance with potentially sub-par economic performance (emphasised in the case studies in the World Bank project by Gelb and associates, 1988) is that the volatility of resource earnings leads to poor investment decisions at the margins during a boom, which in turn accentuates the subsequent recession. The nature of redistribution of oil rents through national or regional budgets is important. As oil exports grow, discontent in oil-producing regions and in the poorest regions of the country grow simultaneously, because oil-producing regions wish to keep a higher share of oil revenues while the poorest regions request higher redistribution. Empirical tools are relatively well developed for examining the macroeconomic linkages and relatively straightforward when it comes to analysing the extent to which state budgets allow decentralised revenue-raising and expenditure decisions.

Empirical research on fiscal decentralisation in CIS transition countries so far is restricted to Russia and empirical testing of the incentive-mechanisms. Using panel data from 2118 Russian municipalities, Slinko (2002) shows that regional disparities increased with fiscal decentralisation, because delayed enterprise restructuring and lack of market institutions hampered the positive results of better incentives at the local level. Timofeev (2002) tests the effect of decentralisation on soft-budget-constraints of local enterprises using panel data of 72 Russian regions from 1995-1997. His results demonstrate that higher rates of tax revenue retention by local governments lead to lower subsidisation of enterprises from local budgets, whereas decentralisation via increased transfers or shared taxes may worsen soft budget constraints. Desai et al. (2005) extend this relationship to regional growth indicators using a comparable data set and produce similar results. Resource-rich “rentier regions” as well as extremely poor regions are identified as vulnerable because of their "unearned income streams", which limit the positive possible effects of fiscal decentralisation. In other words, locally generated value added affects several taxes that accrue to the local budget, and regions with less developed production are likely to see shortages of income in their budgets. On the other hand, Zhuravskaya (2000), using Russian panel data from 1992-1997, shows that expansions of the local tax base were almost entirely offset by reduced central transfers in the following year. This ratchet effect clearly creates no incentives at the local level.

Traditional studies on redistribution of oil revenues are based on budget analysis. The main value-added of the work discussed here is the empirical approach used to assess the impact of the oil boom that tries to make microeconomic linkages that may be difficult to achieve. Both Azerbaijan and Kazakhstan have high quality household survey data, such as a Living Standards Management Study (LSMS) survey in the mid-1990s and high quality annual data since the turn of the century[62]. The household survey data are used to analyse how oil boom effects can be picked up in reported income and expenditure. Among important differences between Azerbaijan and Kazakhstan one should note that in the former oil production sites are located close to the capital city whereas in the latter there are large distances between the oil-producing regions and the two largest cities, where most of the benefits from the oil boom appear to accrue. Micro-econometric analysis and anthropological field survey[63] confirm the weak transmission through wages or state budgets, and that the main transmission mechanism to household income is through unofficial earnings.

4.7.2 Methodology for studying redistribution of oil revenues

To analyse the redistribution mechanisms in oil producing countries, we distinguish three categories based on two main questions: who redistributes oil revenues, and how is it organised?

Firstly, *official public redistribution* encompasses taxes and revenues stemming from oil production shared locally as well as financial transfers from the centre. As discussed in Chapter 3, the share of oil revenues in Azerbaijani and Kazakhstani budgets has increased substantially since the late-1990s. In the oil-producing regions, revenue-sharing schemes generally replace financial transfers from the centre, unlike that which happens in the poorest regions. Local governments may redistribute oil revenues through social transfers. Regional budgets in oil-producing oblasts have largely benefited from oil revenues. However, transfer mechanisms have been put in place and are increasingly important for lagging regions, especially in the southern part of Kazakhstan. In Kazakhstan, between 1997 and 2002, the budget revenues of the five oil-producing regions increased in nominal terms by 280%, whereas the budget revenues of the other regions increased by 180%. Regional authorities in oil-producing regions have increasingly used measures such as fines to increase regional revenues. Previously, central authorities levied greenhouse emission rights but this has become the mandate of regional authorities and, probably as a result, environmental fines increased by 400% in 2004 compared to the previous year.

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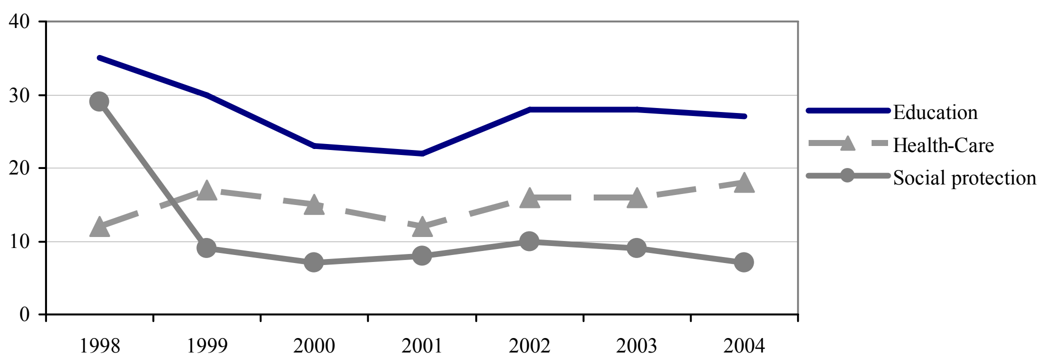
[62] The Soviet household budget surveys (HBS) became notorious for their biased samples. The World Bank sponsored new surveys within the aegis of the Living Standards Management Study (LSMS) with superior sampling, and these practices have been carried forward by the national statistical authorities in their reforms of the HBS.

[63] Saulesh Yessenova carried out fieldwork at the local level in Baku and Tengiz to examine how oil companies can promote local development and the extent to which they impose costs on the local inhabitants. One issue not addressed in this study because of its empirical intractability is the extent to which oil wealth has fuelled corruption, undermined the rule of law and created attitudes inimical to sustainable economic development (Yessenova, 2007).

Several regions (oil-producing or not) have succeeded in benefiting from the revenues of the oil boom. Social expenditures per capita are on average a little higher in oil-producing regions than in non-oil producing regions but in the country as a whole they did not increase between 1998 and 2004 (see Figure 4.7.1). However, Kazakhstan remains a centralised state and local fiscal autonomy appears limited (Dabla-Norris et al, 2000). Fiscal federalism with revenue-sharing arrangements was tentatively developed (McLure et al. 1999) but the implementation seems to vary across regions and criteria for identifying the benefiting regions are obscure. On average, the share of official transfers in regional revenues is higher in poorer regions.[64] Poor regions mainly depend on official transfers from the central authorities. Social transfers are, in principle, crucial for poverty reduction. As expected, official transfers do not reach oil-producing regions (except Kyzylorda region).

Figure 4.7.1 Structure of municipality budgets in Kazakhstan, 1998-2004 (% of total expenditure)



Source: Data from the Ministry of Finance of Republic Kazakhstan.

Secondly, c*ompany redistribution* includes direct, indirect and induced revenues that oil companies invest or spend locally. In the case of the oil sector, there is no need for large employment or for social programmes (or “social assets”), so this type of redistribution may be geographically limited. Oil companies’ headquarters, especially in the case of non-operating foreign companies, employ a limited number of staff. In terms of value added, oil production makes a difference. Since 1997 the growth of regional product per capita has been above the national average for all oil-producing regions, except for the Kyzylorda oblast. The difference is especially large for the old oil-producing regions such as Mangistau and Atyrau (three and four times above the national average growth rate). However, the largest increases in regional product were recorded in the cities of Astana and Almaty.

Oil companies tend to try to contribute to the development of communities where they operate. However, taking into account the immense needs, these projects only address a fraction of infrastructure needs. In the PSA agreements, consortia are requested to invest in social infrastructure projects. Regional authorities propose local development projects, which should reflect the real needs of local communities. Despite their possible local impact, AgipKCO’s investments for example represent only 1.25% of the revenues of Mangistau and Atyrau regions,

64 The difference between the poorest and richest regions in terms of budget revenues is declining, whereas in terms of regional product per capita the difference is widening. Regarding regional budget revenues, in 1997 the ratio between the richest and the poorest regions was equal to 5.4 and, in 2002, it decreased to 3.6. Regarding regional product per capita, this ratio was equal to 5.6 and, in 2002, it increased to 10.3.

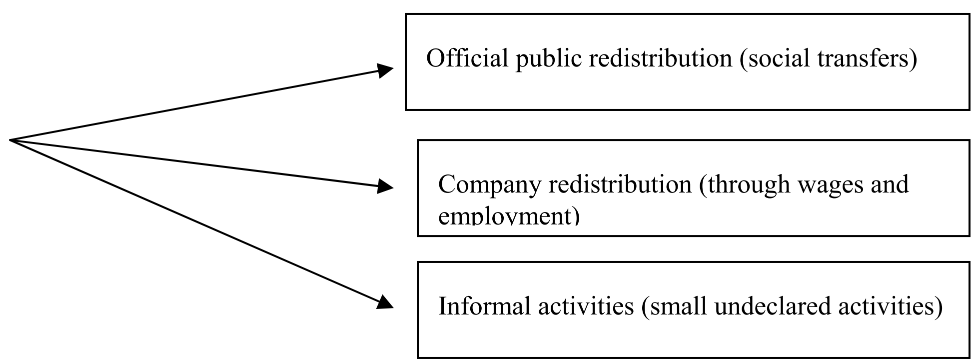
while Karachaganak Petroleum Operating contributed only 6.5% of the revenues of West Kazakhstan region (Abdiev, 2003).

Thirdly, *unofficial redistribution* results from two factors: unregistered household activities and informal “leakage”. Firstly, oil production generates money and mobility of people in the region of production. In order to fulfil the new demands, individuals or households may start small businesses. Self-employment may therefore be a result of oil production. Secondly, revenues may be used indirectly to develop small and often unregistered activities i.e. by informal “leakage” oil revenues are redistributed to the economy. This type of redistribution is the least easy to measure, but the “oil curse” literature refers to such mechanisms, emphasising their negative impact on institutions and consequently on growth (see Section 4.2).

Incomes are typically underestimated in household surveys all over the world and unofficial incomes may be part of the explanation for this. When one compares reported income and expenditure, a large share of expenditure is not matched by a corresponding income. The size of this gap can be treated as a proxy for the unofficial income of a household. Specifically, we assume that if a household’s total expenditure more than doubles its total income such a household is participating in some kind of informal activity.

To analyse the three types of redistribution (official public, company redistribution and informal redistribution), the following mutually exclusive categorical variables are constructed for each household:[65]

Figure 4.7.2 Redistribution channels



- Official public redistribution is the dominant mechanism if the income from wages is less than the income from social transfers and total household expenditures are lower than twice the total incomes of the household. In a household that fulfils both conditions, we conclude that it essentially benefits from official public redistribution (social transfers). This category represents 12.5% of our household sample for Kazakhstan.
- Company redistribution is the dominant mechanism if the income from wages is greater than the income from social transfers and if total household expenditures are less than twice total income. About 44% of the sample is in this category, which is indicative of how little importance the formal sector has in Kazakhstan, and how difficult it is to tax wages.

[65] Redistribution may combine several types of redistribution, but this paper focuses on the main source of incomes, which means that the three types of redistribution are defined to be mutually exclusive.

- Informal redistribution is the dominant mechanism if total household expenditures are more than twice the total incomes.[66] In this case we conclude that the household essentially benefits from informal redistribution, i.e. undeclared activities. The informal redistribution group represents 43.5 % of our sample.

4.7.3 Results and conclusions

In summary, the results of the above discussed analysis using household survey data to distinguish between channels for redistribution of oil boom benefits suggest that the effects of higher wages in oil-producing regions and of social transfers are somewhat limited, and that informal earnings (captured by households having much higher expenditures than incomes) are more important in the oil districts than in the country as a whole. This result may be partly owed to the fact that informal redistribution may include small-scale agriculture, which is dominant in rural areas such as those where several oil fields are located. There is some evidence that low skilled people and rural area inhabitants are not benefiting from oil sector development, which is consistent with reports from the Tengiz region of complaints by the local population that they are not employed in oil production (Yessenova, 2007). Households in Astana and Almaty seem to benefit from the oil boom mainly through informal redistribution. Informal earnings are even more prevalent for households in Astana, the new national capital, and to a lesser extent in Almaty, the financial capital, than they are in the oil-producing regions.

These results are limited to Azerbaijan and Kazakhstan. However, these countries can in some way be treated as representative CIS countries.

It is important to note that apart from the obvious economic consequences for income inequality across and within regions, “fair” redistribution of oil revenues has important political implications. Surging exports of oil can simultaneously increase discontent in oil-producing regions and the rest of the country, as oil-producing regions wish to keep a higher share of oil revenues, whereas the rest of the country insists on a higher redistribution share (see Ikein et al. (1998) discussing the case of Nigeria). Alternatively, a struggle can occur between the oil-producing regions and the central government, as the bulk of the resource rents leaks to the capital city, leaving oil-producing regions in poverty (for discussion on Russia see Dienes, 2002; on Kazakhstan see Najman et al., 2007b).

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Desai, R.M., Freinkman, L. and Goldberg, I. (2005) ‘Fiscal Federalism in rentier regions: Evidence from Russia’, Journal of Comparative Economics, 33: 814-834.

[66] We tried alternative definitions of informal redistribution, and hence of the other categories; setting the lower boundary for informal expenditures at households whose expenditures exceeded 1.5 or 2.5 of their total incomes and did not significantly change the share of households in the three redistribution categories.

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5. CIS role for the EU energy supply

5.1 Introduction

This chapter analyses the current and potential future importance of the CIS region for the EU's energy supply. In doing so it takes into account significant differences between member states in import dependency of oil and gas, in diversification of directions of energy imports and in reliance on Russia and other CIS countries for supplies of energy commodities. Given that the development of transport infrastructure for natural gas (and to a lesser extent also for oil) is crucially important for CIS export potential and export directions, we also cover transportation issues.

The key questions underlying this work are the extent to which CIS oil and gas production and exports might be increasing and how much of these energy resources (natural gas in particular) the producers might be willing to ship to consumers in EU countries. In the case of oil, given the global nature of the market, the combined export potential of the CIS region matters in determining global oil prices, while export directions are less of an issue. The situation is different for natural gas, where pipelines largely determine how much of this commodity can be sent and where. In this case, apart from analysis of existing and planned pipeline networks, we also look at various legal and contractual solutions in gas trade that may prove important for the volume of trade between the CIS and the EU. A good understanding of the interests of various players (e.g. Russian Gazprom) is important for this analysis.

Apart from providing analysis of current and most likely future trends we also assess developments in EU-CIS energy relations.

The structure of this chapter is as follows. The next section looks at current EU energy demand and imports, outlining the CIS's role as supplier of energy commodities and the heterogeneity in directions of imports among EU countries. It also discusses forecasts for EU demand up to 2030. Section 5.3 analyses CIS countries' levels, directions and transit routes of energy exports, and in particular exports to EU markets. Apart from presenting the current situation it also contains an outlook for the future, discussing, inter alia, the role of exports to the EU versus expansion to other markets, notably in Asia. Section 5.4 looks at the legal aspects, in particular related to gas contracts as these may prove important for EU-CIS energy relations. The next section focuses on the inter-linkages between EU – CIS / Russia relations at different levels, i.e. between governments and companies. Section 5.6 looks at various risks related to the potential of CIS energy exports to the EU, aiming to disentangle the real issues from the red herrings. The final section summarises the main conclusions of this chapter.

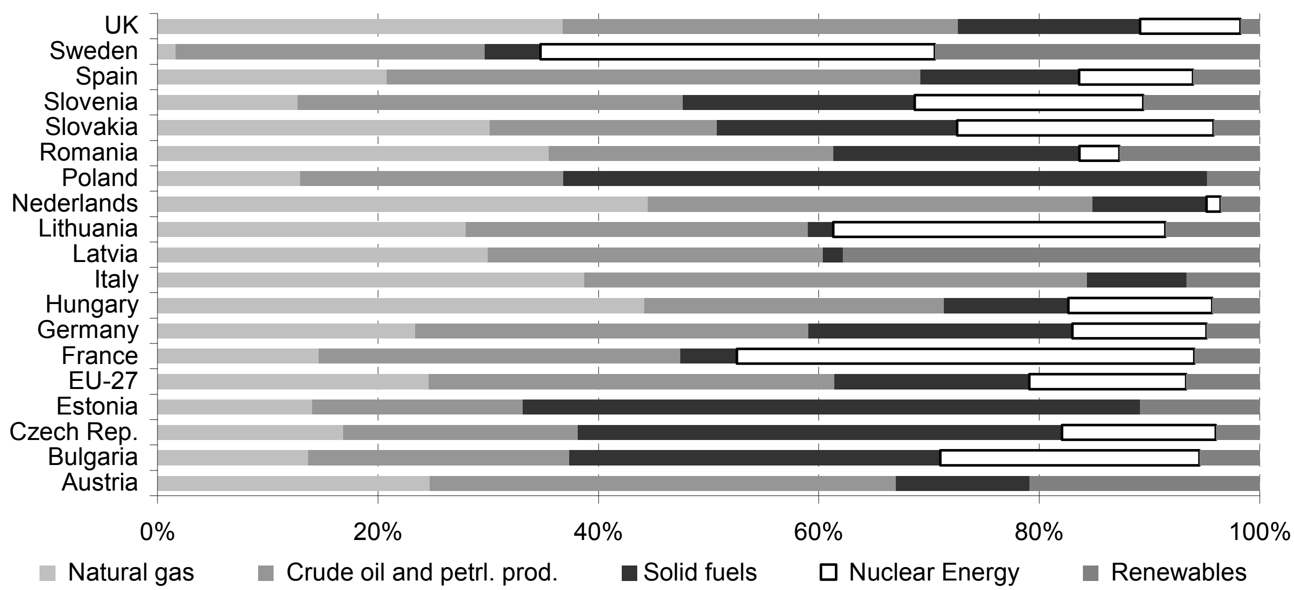
5.2 EU energy demand, consumption and imports

5.2.1 EU energy demand and consumption

In 2005, oil and natural gas accounted for around 66% of final energy consumption in the EU27, with the dominant role of oil, accounting for more than 42% (DG TREN, 2007). There are substantial variations from these averages among member countries, which are mainly related to the structure of electricity generation. In several European countries oil and gas dominate in total primary energy consumption, reaching 96% in Cyprus and 83% in the Netherlands. Italy's, Greece's and Ireland's oil share in the primary energy mix is already above 60% (Figure 5.1).

Natural gas plays an important role in most EU countries, especially in the UK, the Netherlands, Italy and Hungary, while the EU27 average share is 27%. At the same time there are countries in the EU where hydrocarbons account for less than 40% of total energy consumption: this is the case for Sweden and Poland. Also these two countries have the smallest share of natural gas in their energy mix in the EU, at only 1.6% for Sweden and 13% in Poland. Apart from hydrocarbons, the EU27 energy mix is made up of coal (18%), nuclear (14%) and renewable energy (7%) as shown in Figure 5.1.

Figure 5.1. Structure of gross inland energy consumption, selection of EU countries, 2005



Source: Eurostat (2007b, c).

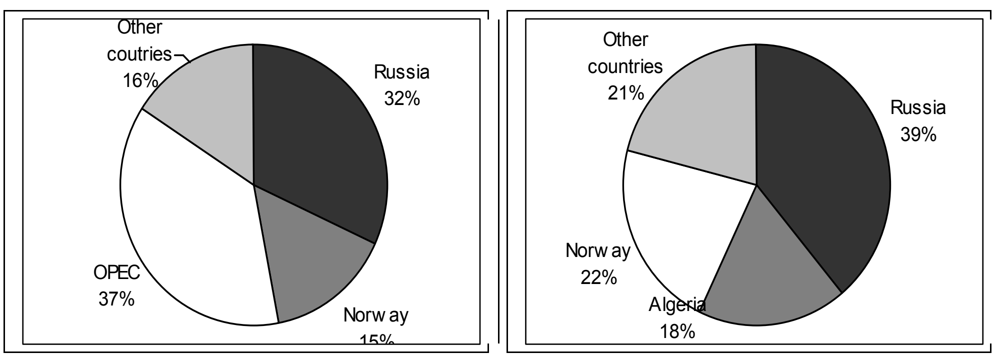
Oil and gas consumption and imports

Internal oil consumption in the EU27 reached around 735 Mt in 2006, while of gas it was 486 bcm (Eurostat, 2007b, c). Almost 90% of both oil and gas was consumed by the EU15 countries, with only about 10% by those that joined the EU in 2004 (EU10). Domestic oil production has been declining fast in the last few years and in 2006 covered just over 15% of total consumption. EU production of natural gas has also been declining, although at a slower pace than in the case of oil. In 2006, gas production in the EU27 stood at 199 bcm (mostly coming from the UK, the Netherlands, Germany and Italy), which covered about 40% of domestic needs. Fast growth of gas consumption implies that the EU's reliance on imported gas has been increasing.

In terms of the origins of the EU's oil imports, OPEC countries together account for around 37%, followed by Russia (around 32%) and Norway (15%) (Figure 5.2). There are substantial differences in the geographical structure of imports in different EU regions. Southern countries buy most of their oil from OPEC countries. At the same time the EU10 mostly rely on imports from Russia (around 90% in some instances). Norway is the most important supplier among the northern EU countries. Beyond Russia, other CIS countries play a significantly smaller, although gradually increasing, role in EU oil imports. In 2006, Kazakhstan's share in the volume of EU oil imports was around 4%, and 2% in the case of Azerbaijan. Kazakh deliveries played a more substantial role only in imports to Romania and Austria. Figure 5.3 illustrates the heterogeneity in reliance on CIS and Russian oil supplies among EU member states (see also Table A.5.2 in Appendix 4).

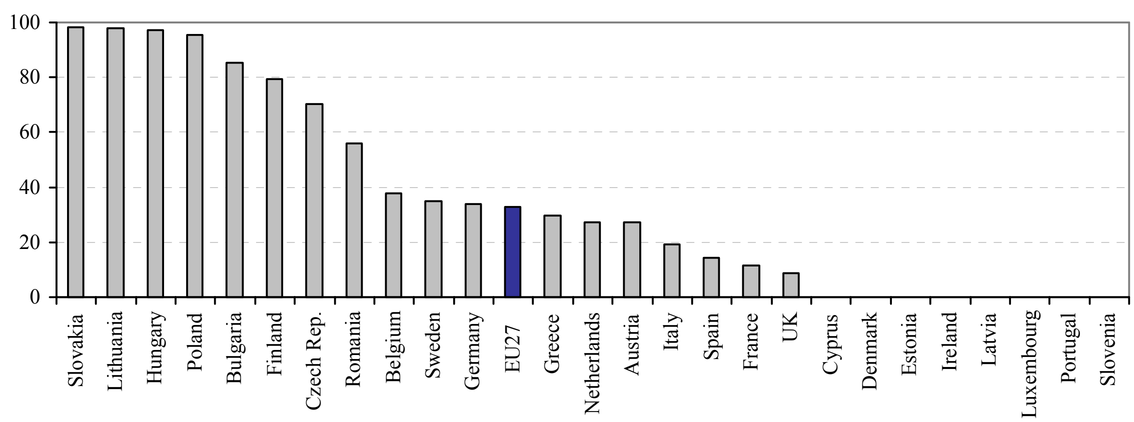
The main sources of EU27 gas imports are Russia (39% in 2006, a fall from the 49% level observed in 2000, albeit part of this fall may reflect the handling of Russian gas re-exported through Ukraine and of Central Asian gas transited through Russian pipelines), Norway (22%) and Algeria (18%). The role of specific suppliers varies in different EU regions. Northern EU countries rely on own gas produced in the North Sea area and on imports from Norway. In southern Europe the main suppliers of natural gas are African countries (Spain and Portugal import 70% of their gas from there), mostly Algeria. Southern countries are also the main recipients of LNG, accounting for 85% of total EU LNG imports. Russia is the main supplier to the EU10, covering above 80% of its gas needs. There is a relatively little diversification of gas imports in these countries and all fully rely on gas transported by pipelines. This all implies that in several EU countries (e.g. Hungary, Slovakia) Russian gas accounts for a high share of total primary energy supply (TPES) or inland gross consumption. More recently, some EU10 countries (e.g. Poland, Hungary) have been purchasing more substantial volumes of Caspian gas. Figure 5.4 illustrates the heterogeneity in reliance on Russian gas supplies among EU member states.

Figure 5.2 EU27 oil (left panel) and gas (right panel) import sources, 2006 (% of extra-EU imports)



Source: Eurostat (2007b, c).

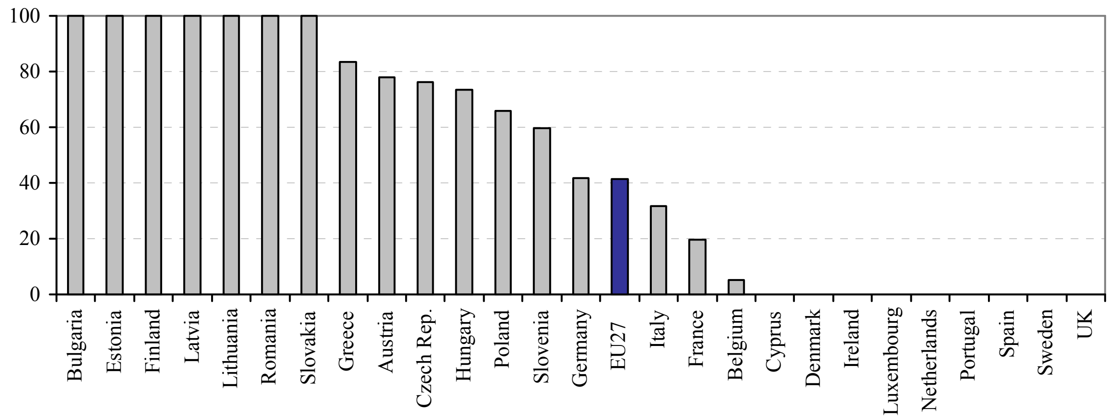
Figure 5.3 Volume of oil imports from Russia as a share of total imports, 2005 (% of total imports)



Note: For EU27 the share in net extra-EU imports is shown. For members states – shares in total imports.

Source: Calculations based on Eurostat (2007c).

Figure 5.4 Volume of gas imports from Russia as a share of total imports, 2005 (% of total imports)



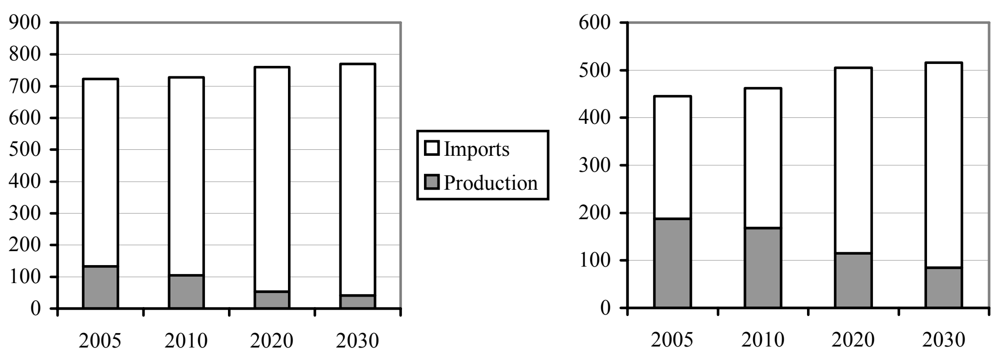
Note: For the EU27 the share in net extra-EU imports is shown. For members states – shares in total imports.

Source: Calculations based on Eurostat (2007c).

Energy demand outlook

According to DG TREN (2008), EU27 primary energy demand is forecast to rise by 10.7% up to 2030 (at an average annual rate of 0.4%), with much faster growth experienced by the EU10. DG TREN (2008) and several other sources foresee a increase in oil consumption of 6.4% for the period between 2005-2030, and a significant rise of 16.2% in demand for gas in the EU up to 2030. Natural gas demand might increase by around 0.6% annually (DG TREN, 2008). As demand increases and domestic supply contracts further, a gradual but significant rise of imports is expected (Figure 5.5). According to DG TREN forecasts (2008), the EU will import almost 70% of its energy resources by 2030, 84% of natural gas and affectively 100% of oil.

Figure 5.5 Outlook for the EU25 in oil consumption and production (ktoe– left panel) and gas consumption and production (ktoe – right panel), 2005-2030



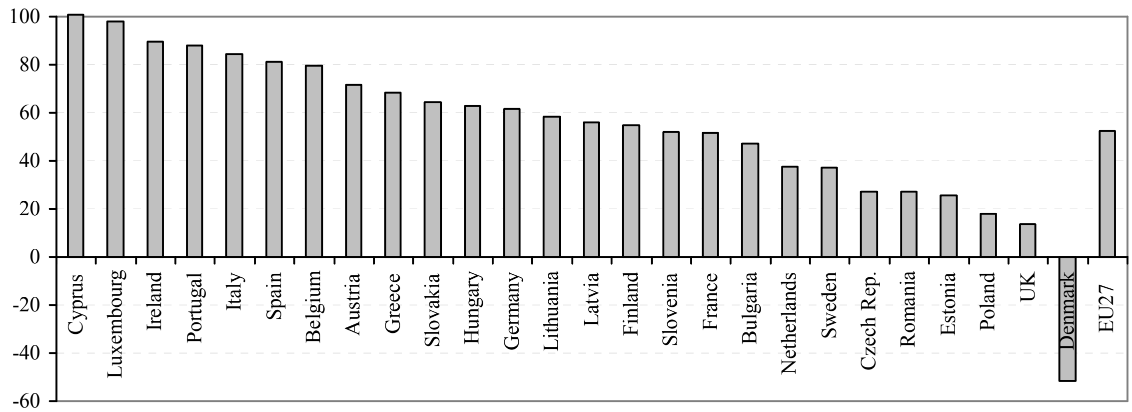
Source: DG TREN (2008).

5.2.2 Import dependency

The degree of energy import dependency (the ratio between net imports and total domestic consumption) in the EU27 was 52% in 2005, a 10 percentage point increase from 1994. It varies significantly between the member countries. For Belgium, Cyprus, Ireland, Italy, Luxemburg, Portugal and Spain import dependency is in the range 80-100% (Figure 5.6). For the Czech

Republic, Estonia, Poland, Romania and the United Kingdom the figure is below 30%. Only Denmark is a net energy exporter.

Figure 5.6 Import dependency, all fuels (in %, 2005)

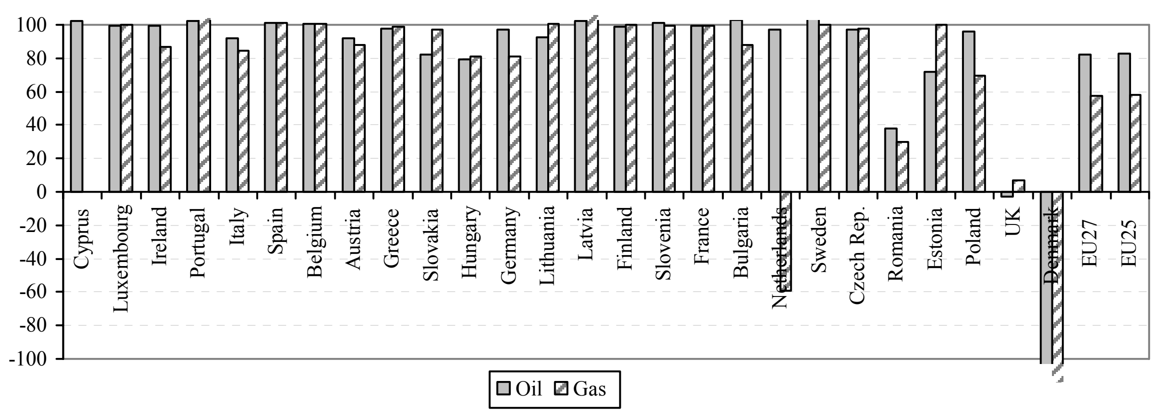


Note: For the EU27, the share in net extra-EU imports is shown. For members states – shares in total imports.

Source: Calculations based on Eurostat (2007c).

For oil, the average EU import dependency was around 83% in 2005, compared to 75% in 1994. Only Denmark was a net exporter of oil, the other larger producers being the UK and Romania, while a large group of countries is totally dependent on imports (Figure 5.7. see also Table A.5.1 in Appendix 4).

Figure 5.7 Import dependency, oil and gas (in %, 2005)



Source: Eurostat (2007a).

In 2006, the EU27 imported close to 60% of its gas consumption. Denmark and the Netherlands are net exporters of this fuel, the UK has only recently become a net importer, while Belgium, the Czech Republic, Finland, France, Portugal, Slovak Republic, Spain, Sweden, Slovenia and Baltic countries are totally (or almost totally) dependent on imports. In general, the biggest EU importers of gas (Germany, Italy, France and Spain) have quite well diversified sources of supplies[67].

The DG TREN (2008) scenario envisages a continued rise in the EU's import dependency in oil and gas, due to declining domestic production and also a rise in consumption (Figure 5.5). Oil dependency might reach effectively 100% in 2030, and this would translate into a increase of 23.7% in oil import volumes.

EU gas demand is forecast to increase almost three times more than oil demand up to 2030, by 68%. This, combined with an expected decline in domestic production, would lead to sharp increases in import volumes and import dependency (up to 84% in 2030). These forecasts sometimes abstract from the problem of the availability of gas supplies, which may be acute given the currently available information on the future production potential of the major suppliers (Russia, Algeria, Norway).

Summing up, the expected rise in EU gas import demand is much sharper than in the case of oil. Russia is currently the largest oil supplier to the EU (over 30% of imports and 25% of total supply) and natural gas (close to 40% of EU imports and 24% of total supply). Norway and North Africa also have significant shares (around 15% of EU imports each for oil and over 40% together for natural gas). These countries will remain the key suppliers to the EU, but their future shares are somewhat uncertain.

This expected higher EU energy import dependence has raised increasing attention and concerns. On the other hand, obviously importing in itself is not a bad thing – if a country deals with reliable suppliers. Import dependency does not necessarily imply lower energy security or risks, provided import sources and routes are secure and diversified. This is largely the case for EU oil imports, the origins of which are regionally varied and take several routes (sea borne and by land).

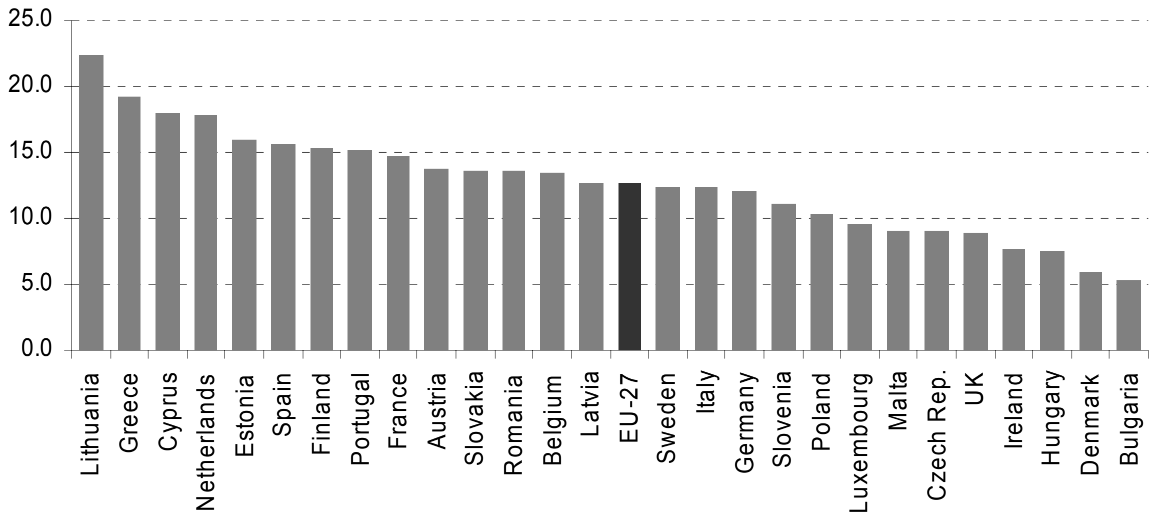
Besides, oil infrastructure in Europe is well developed, so that even potential problems with supplies from certain traditional sources can be easily replaced by deliveries from elsewhere. Most countries can rapidly switch to alternative suppliers and sources (e.g. Poland, which normally relies on Russian crude from the Druzhba pipeline, can import most of its crude oil needs through the Gdansk oil terminal, while the Czech Republic can import oil through the IKL pipeline connected to the Trans-Alpine line in Germany, and Hungary and the Slovak Republic through the Adria pipeline from the Rijeka oil terminal). Also, all EU15 countries and most new member states have developed and set an energy security system based on emergency preparedness and oil stockpiling in compliance with EU standards and in some cases also in line with IEA requirements.

The situation with natural gas is somewhat different as the large majority of trade relies on pipelines and the possibilities for switching between suppliers are much more limited. In this sense the dependence on Russian natural gas can be considered substantial for some EU countries. Still, even in the case of high or full dependence on one supplier, another layer of energy policy can mitigate risks.

[67] The main sources of gas in selected EU markets as of 2006 (based on IEA data): Germany - indigenous (19%), Netherlands (25%), Norway (26%), Russia (39%); Italy - Norway (7%), Netherlands (11%), indigenous (13%), Russia (27%), Algeria (33%); France - Russia (16%), Algeria (16%), Netherlands (18%), Norway (29%); Spain - LNG imports, mostly from MENA countries (72%), pipeline from Algeria (21%), Norway (6%).

Another perspective on energy import dependency is the role of energy imports in total EU merchandise imports. In 2006, despite very high international oil prices, this share was only 13% for the EU27 (Figure 5.8). Thus, energy does not dominate EU imports and the energy bill cannot be considered an exceptionally heavy burden. On the other hand, this share is much higher in the EU10 (22% in Lithuania) and Southern Europe (19% in Greece) and may further increase if both energy prices and domestic demand continue to rise.

Figure 5.8 Share of energy goods (energy imports) in total EU imports in 2006 (in %)



Note: Data on Bulgaria and Hungary, which are important oil and gas importers, may be underestimated.

Source: own calculations based on Comtrade.

5.3 CIS energy production and exports

5.3.1 Overall assessment

As discussed in section 3.3, CIS countries possess the biggest gas reserves in the world and significant reserves of oil. Most of the CIS's oil exports (over 90%) are transported westwards, with minimal volumes reaching China, the US and Iran. Practically all CIS gas exports are directed to Europe from or through Russian territory. Only limited quantities of Turkmen gas are exported to Iran[68]. In the next decade Europe will remain the main recipient of CIS hydrocarbon exports, but bigger quantities of oil and gas will be reaching other markets, with Asia, notably China, becoming more important. Still there is a quite limited possibility that exports in non-European directions will negatively impact on European supplies.

5.3.2 Production and export levels and outlook

By far the most important among the CIS energy producing countries is **Russia**, the biggest global producer and exporter of gas and the second largest producer and exporter of oil (after Saudi Arabia). Russia's share in CIS output is about 80% for oil and 79% for natural gas,

[68] Since the beginning of 2008 these imports have been stopped (probably temporarily) owing to a Turkmen-Iranian disagreement.

according to IEA (2007a, b) data, but diminishing slowly (down from, respectively 87% and 84% in 1995), due to faster expansion of Caspian region production.

Forecasting both Russian oil production and export potential is quite difficult due to the large margin of uncertainty over investment in new hydrocarbon fields and export capacities, the rate of recovery, internal market developments and regulatory framework (access to upstream and pipelines for independent producers, etc.). Russia's energy strategy (Government of Russia, 2003) envisages a continuation of the present trend until 2020. On the one side, forecasts from the 2003 strategy appear quite conservative and already by 2005 oil output had reached the levels foreseen for 2010 in the optimistic scenario (470 Mt) and in 2007 hit 491 Mt. On the other hand, some experts expect peak production to occur between 2008 and 2010 with a subsequent gradual decrease (see e.g. Juurikkala and Ollus, 2006, or the interview with Lukoil's vice-president in the Financial Times in April 2008[69]). Development of new deposits, changes in Russian policy and an increase in the level of investments in the country's upstream are needed to overcome the presently perceived difficulties (Brookings Institute, 2006).

The future volume of Russian oil (crude and oil products) exports is similarly hard to predict over the longer term. According to the government's 2003 energy strategy, it depends on multiple external factors (oil prices, global economy growth, etc) and in 2020 may be between 305 Mt and 340 Mt, compared to over 350 Mt actually recorded in 2005 (see Figure 5.9). Crude volumes alone could range from around 310 Mt to almost 400 Mt in 2020, compared to around 250-260 Mt in 2006-2007 (according to Goskomstat data). Here again, the forecasts from the 2003 strategy were surpassed in 2005. The IEA (2007a) Reference Scenario foresees higher output volumes for 2020, which suggests bigger export potential (reaching 390 Mt), but it also envisages a stagnation of growth in 2010-2020. Also, the IEA outlook presented in its Reference Scenario does not take into account possible Russian government policy measures (e.g. aimed at reducing internal consumption).

Russia's strategy foresees diversification of oil export directions, leading to an increase in supplies to China and other Asian countries (up to 30% of total exports in 2020) and to the US and a decrease in the relative importance of European exports. It is difficult to predict if this objective can be reached, with present output trends constituting a major obstacle. At present the most important Russian investment projects in oil export infrastructure – expansion of the Baltic Pipeline System (to Primorsk or Ust-Luga), the Bourgas-Alexandroupolis pipeline to connect the Bulgarian Black Sea and Greek Aegean Sea or take-over of oil terminals in the Baltic states – are aimed at increasing the export potential of westward routes, mostly to Europe. The only eastward project is the East Siberia-Pacific Ocean pipeline, the construction of which is due to start in 2009. Additionally, the investment activities of Russian oil companies (buying downstream assets in Europe) also tie their interests even more strongly into the EU market. However, it is worth remembering that as far as oil is concerned the future directions of Russian exports are not expected to play any significant role for the oil markets in the EU (as the only impact will be via global volumes of exports).

Russia's gas sector has also been experiencing very moderate growth in output, recently averaging 2% per annum in the last 6 years. According to the 2003 Russian energy strategy (Government of Russia, 2003), in the optimistic case growth at a slightly lower rate will continue until 2020 (see

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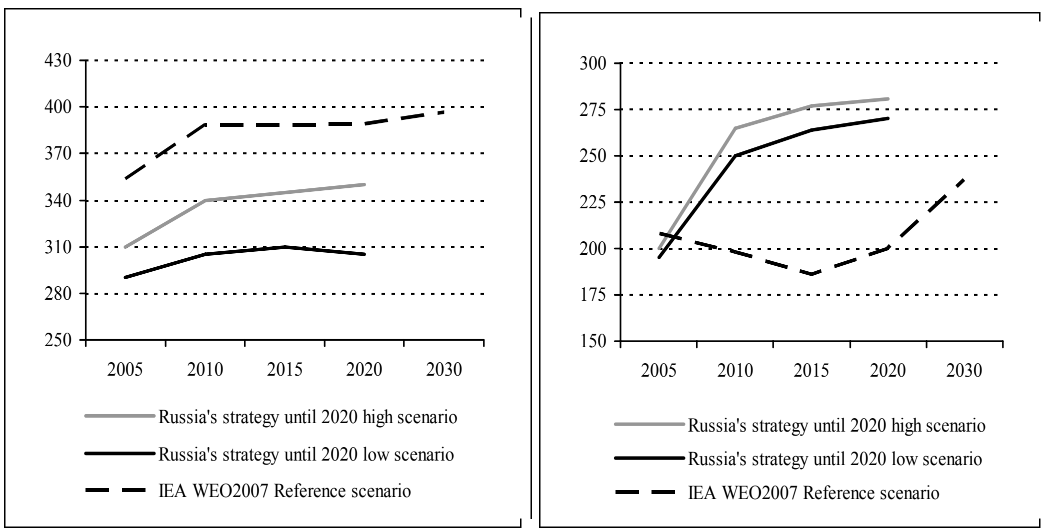
69 See the Financial Times, 15 April 2008, http://www.ft.com/cms/s/0/e8dbf9c8-0a85-11dd-b5b1-0000779fd2ac.html?nclick_check=1; http://news.bbc.co.uk/hi/russian/business/newsid_7348000/7348973.stm.

Figure 5.9) [70]. Again, according to some views, the actual path of output appears to be above the optimistic scenario (CASE Transcaucasus, 2008), although there may be data issues related to the exact level of production. Most growth should come from independent producers as the output from Gazprom's fields is decreasing. In the opinion of more sceptical analysts, production will probably decline, as independent producers have no incentives to invest in production and no ability to export. Russia's export obligations could then only be met if Gazprom succeeds in the longer term in maintaining its control over Caspian gas production, and / or it redirects a substantial part of its present CIS gas exports to the EU and / or if growth in internal consumption is limited and energy waste reduced thanks to energy efficiency policies. Russian domestic gas consumption is huge, at around 453 bcm in 2006, according to IEA data, which is only slightly less than the total gas consumption of the EU27. Russia's domestic gas consumption is expected to increase in the coming years, although there is a large degree of uncertainty over this outlook (see e.g. CASE Transcaucasus, 2008, for discussion). In 2006, Russia exported 202 bcm (IEA), i.e. just above 30% of its total gas production.

Figure 5.9 Russian oil (left panel, Mt) and gas (right panel, bcm) export forecasts to 2020/2030



Note: IEA (2007c) provides actual export figures for 2005; 2005 forecasts from the 2003 governmental strategy are presented for comparison.

Sources: Government of Russia (2003), own calculations based on IEA (2007c).

Russia's gas exports were projected to reach 275-280 bcm in 2020, according to the 2003 government strategy. In stark contrast to this, the 2007 World Energy Outlook (IEA, 2007c) predicts a decrease in exports between the current period and 2015, followed by a recovery thereafter (actually, IEA forecasts are significantly below the totals of future already *contracted* Russian gas exports). Still, this only translates into gas export potential of around 200 bcm by 2020. The divergence in projections is thus very substantial. Possible explanations include different estimates of future Russian internal gas consumption (which is relatively sensitive to domestic pricing policy) and different views as to possible upstream developments. The risk of the pessimistic scenario materialising is cause for some concern for European consumers and

[70] Updated working forecasts provided by the Russian Government at the EU-Russia Energy Dialogue in May 2008 show production and export figures for oil and gas up to 2030 which where significantly revised upwards: for oil those exports figures are 317/362 Mt (low/high scenarios), while for gas those are 320/354 bcm.

constitutes a challenge to EU energy security strategy (see also chapter 2 for a discussion of the relevant literature). If such a decrease takes place (which is considered unlikely), Russia could face problems supplying all the gas volumes it has contracted to EU consumers.

The second major source of CIS hydrocarbons is the **Caspian region**, accounting for around 20% of CIS oil exports (or around 80-85 Mt) in 2006 and gradually gaining importance in line with strong output growth. The most important Caspian oil producers are Kazakhstan and Azerbaijan. Kazakhstan experienced a period of rapid growth in output in the years 1996-2003 and since then production and export growth have moderated mostly due to delays in launching production from some of the most important oil fields in the country (notably Kashagan) and limited growth in export infrastructure (e.g. halted expansion of the CPC pipeline). Export infrastructure shortages can be overcome thanks to the continued work on the Kazakhstan - China oil pipeline, and a kick-off in the Kazakh Caspian Transport System (KCTS) project[71]. Kazakh policy aims at diversification of export options. It seems though that, in spite of other possibilities, the western (probably European) direction will stay the most favourable for Kazakhstan (due to price considerations, possibility of entering lucrative downstream markets and of upgrading know-how in the country). In the near future Kazakhstan will be able to send westwards 75-80% of its crude (mostly via the expanded CPC, and later possibly also through the BTC), with smaller quantities shipped to Asia, mainly China and Iran. In an optimistic scenario, oil production may reach 130 Mt (which would be close to one third of present Russian oil output), with natural gas production at around 35 bcm by 2015. However, this scenario would require bullish investment, underpinned by a high technical success rate in exploration and production efforts as well as strong regional co-operation among all Caspian littoral states.

The second largest Caspian oil producer - Azerbaijan – has been experiencing an oil production boom, particularly since the opening of the major export outlet (the Baku-Tbilisi-Ceyhan oil pipeline, with a capacity of 50 Mt annually, or 1 mb/d) in mid-2005. In 2006, production grew by some 45% and is expected to reach a peak of about 60 Mt in 2009-2010. After 2015, volumes are expected to decline quite rapidly.

Four Caspian countries produce natural gas: Turkmenistan, Uzbekistan Kazakhstan and Azerbaijan. Turkmenistan and Uzbekistan have similar production levels, but Turkmenistan exports much larger volumes of gas. This country also has the largest (although uncertain) potential for development. After the steep decline in its production in the 1990s, the country is now enjoying a period of growth, with output reaching 67 bcm in 2006 (according to IEA data), although it is still below its 1980s levels. One of the major obstacles for production growth is limited export capacity. After the 2007 presidential change, the potential for attracting new investment in both field development and transport routes may have increased, which may in turn have led to a significant increase in total output. The actual size of this increase is still hard to assess, although Turkmen authorities claim it will reach 100 bcm output by 2010 and 250 bcm in 2030.

In the Caspian area, the oil export potential of Kazakhstan and Azerbaijan may be in a range of 125-175 Mt by around 2020. Potential Caspian gas exports are extremely difficult to predict with

[71] KCTS is an oil transportation project for Kashagan field output, with a planned pipeline to the Kazakh shore (Aktau), the building of terminals and a tanker fleet. Participants of the project include ENI, Total, Royal-Dutch Shell, ConocoPhillips, KazMunaiGaz, Inpex, ChevronTexaco, ExxonMobil, KazMunaiGaz, and LukoilArco. Costs estimates are in the range of USD 3-4 billion, planned capacity is 25-38 Mt and the project completion is planned for around 2010.

any degree of precision. All determinants of export trends mentioned in the case of Russia are also valid for the Caspian region, and transport infrastructure may prove to be among the key factors, due to the landlocked location of the main producers and limited capacity of existing pipelines to potential markets other than Russia.

5.3.3 Export directions

Over a half of Russian oil production is exported, with EU countries the most important destination (more than 70% of exports going there in 2005, and probably even more since 2007 EU enlargement). Russian crude is also supplied to other CIS countries (15%) and to the 'new markets' of the US and China (9%)[72]. In recent years we have observed a rise in oil product exports (to around 100 Mt in 2005, almost twice the 2000 volume[73]). In 2006, EU countries imported 32.5 Mt of oil products from Russia (with substantial imports also from Belarus – whose refineries are processing Russian crude).

Russia exports only 31% of its huge internal natural gas production (656 bcm in 2006, or 22% of the world total, according to IEA data). The EU receives roughly two thirds of total Russian gas exports, with the rest being exported to other European (Turkey) and CIS countries.

The Asian markets are sometimes presented as potential competitors for Europe in its quest to secure gas supplies from the CIS region. However, a more in-depth analysis reveals that there is little risk that this could happen on any more significant scale in the medium term. The key reason for this is that the gas fields that can supply Asian markets are typically too distant from the EU to make deliveries to Europe economical. Box 5.1 provides more details.

Box 5.1 CIS energy exports to Asia - myths, realities, perspectives

Asian markets, mostly China, are sometimes perceived as the main competitor for the EU in access to CIS energy resources. The biggest fear is a redirection of a substantial part of Russian gas exports from Europe, especially since the Kremlin started to declare openly its wish to diversify Russia's export options and in 2006 signed an agreement on building a gas pipeline (with an envisaged capacity of 30-40 bcm annually) and oil pipeline (an envisaged capacity of 50 Mt annually) to China. On the other hand there exist forecasts of a stagnation in Russia's oil output and possibly of a decline in gas export potential (IEA, 2007c), which puts into question not only these plans but the future Russian capacity to fulfil already concluded contracts.

What are the facts?

Eastern Asia (China, Japan, South Korea) is the biggest and given its geographic location also a natural market for CIS hydrocarbons to be supplied from East Siberian fields, which have no connection to Europe. Thus, it seems that there is no direct competition between Europe and Asia on these remote fields. Development of these new fields and new transit infrastructure will be very costly, and will probably require some financing from the Asian consumer markets, which seems likely. At present, CIS exports to China are limited to oil - until recently mostly by rail. In mid-2006 the first leg of the Kazakhstan-China pipeline was opened enabling exports of 10 Mt a year with a plan for expansion to 20 Mt by 2010[74]. In 2006, CIS exports to the Chinese market accounted to 11 Mt, with Russia's rail

[72] This assessment is based on own calculations using IEA statistics, oil companies press releases, etc.

[73] Data for 2000 from IEA statistics, but for 2005 from FSU Energy, 20.01.2006, Petroleum Argus (IEA reports a slightly lower 2005 figure - around 85 Mt).

[74] See http://www.jamestown.org/edm/article.php?article_id=2372502.

shipments constituting a major part (80%)[75]. The prospects of finalising the construction of the long-discussed pipeline from Russia to the Pacific Ocean (East Siberia-Pacific Ocean) have recently seemed more probable – with the Russian Ministry of Industry and Energy's recommendation in early 2008 to finish it before expansion of the Baltic Pipeline System. It would, however, be served by different oil fields than those used for EU markets. The eastward route pipeline also points to the Russian intention to have the possibility of exporting to different Asian countries (Japan, South Korea), and not only China, which was the focus of the earlier formulated plans.

No gas exports from the CIS area to China have started yet. Turkmenistan has been selling around 6 bcm a year to Iran for several years now (temporarily halted in early 2008 probably due to price disagreements). There are some quite advanced projects, though, the most important being a gas pipeline from Turkmenistan via Uzbekistan and Kazakhstan to China. The pipeline, with an estimated cost of about USD 7.3 billion (around 30% of this to be covered by Chinese companies), may be opened in 2009 and will eventually reach a capacity of 40 bcm. Some 75% of this capacity will be supplied by Turkmenistan (according to the 2006 contract) and the rest by Kazakhstan and Uzbekistan. There is also a plan to build a gas pipeline with a capacity of 30-40 bcm from Russia to China. A preliminary agreement on this was signed in early 2006. No further details on this project are available and although one cannot rule out it going ahead it seems at the moment a rather long-term prospect. More advanced are export projects to Japan – with Sakhalin 2 close to starting LNG exports (ownership problems halted the project, see the case study on re-nationalisation of oil upstream in Russia in Box 6.3 in Chapter 6). Russia has been recently promoting at least two other strategic gas pipeline projects – Nord Stream and South Stream, which would increase its westwards export capacity but require large financial efforts. Both of these projects seem more advanced than the Chinese one. The slowdown in the rise in Russian output forecast by the IEA WEO projections would be an obstacle to the realisation of any additional pipeline project.

It is likely that Russia would use East Siberia/Sakhalin deposits to supply China and other Asian markets (Japan, South Korea), which would be logical due to their geographical proximity (and distance from Europe).

The above shows that at present real energy cooperation with China and other Asian countries has been started by Caspian oil and gas producers, but that this still should not become the major direction of their exports. Russia, despite many plans and preliminary agreements, does not seem to have committed itself firmly to any exports to China (and other Asian countries). On the contrary, it is actually developing its westwards oil and gas export potential. If some substantial volumes of hydrocarbons are to be directed to China they would come from the new fields not currently used for EU supplies. It is therefore hard to imagine that China could become in the medium-term an important destination for Russian oil and gas sales (see also Goetz, 2006).

Source: Multiple sources (studies, company reports, press articles).

At present, Caspian oil exports to the EU remain limited when compared to Russia's. In 2006, Kazakhstan exported 22.8 Mt of crude oil and 0.76 Mt of oil products (3.5% of total EU oil imports); Azerbaijan 11.8 Mt and 0.56 Mt of (1.8%), and Ukraine 0.8 and 0.6 Mt (Eurostat, 2007b). For comparison, EU imports from Russia reached 184 Mt of crude and 32.5 Mt of oil products in the same year. Out of a total oil export value of USD 30 billion in 2006, Kazakhstan accounted for over 80%, followed by Azerbaijan (17%). For comparison, Russian oil exports were valued at USD 141 billion.

The main destinations of gas flows from the Caspian region are currently other CIS countries, mostly Russia, for which gas imports from Central Asia are crucial to maintaining its exports to Europe (at higher prices). Only very limited quantities of Uzbek and Kazakh gas were reaching the EU markets in 2006 (see Table A.5.4 in Appendix 4). Gas companies in the Caspian region do not sell gas directly to European markets. Until early 2008, contracting and deliveries to Ukraine

[75] From Energy Intelligence, Nefte Compass from 18 January 2007
http://www.eia.doe.gov/emeu/cabs/Russia/Oil_exports.html, accessed on December 2007 and
http://www.jamestown.org/edm/article.php?article_id=2372502.

and EU countries were through intermediaries, such as the RoskUkrEnergo (co-owned by Gazprom and Ukrainian businesses), which acted as gas trader and carrier between Turkmenistan and Ukraine.

In 2006, Caspian gas's export value reached around USD 5.6 billion, of which Turkmenistan accounted for over 70%, Kazakhstan for 17% and Uzbekistan for 12%, according to Comtrade data. For comparison, the value of Russian gas exports was around USD 43 billion.

Summing up, there is substantial uncertainty about future CIS gas and oil sales to the EU. In the case of Russia, we believe that the EU will remain the main gas export market and in particular it is unlikely that any re-orientation of sales that were originally scheduled to the EU is possible. The gradual expansion into Asian markets will be based on the development of fields, which in any case are too distant from Europe to make deliveries there economically viable. Over the next two decades, Russian gas exports to the EU are likely to stay in the range of 150-200 bcm.

5.3.4. Export and transit routes

This section provides an overview of the existing export oil and gas infrastructure as well as planned or envisaged projects (see oil and gas maps below).

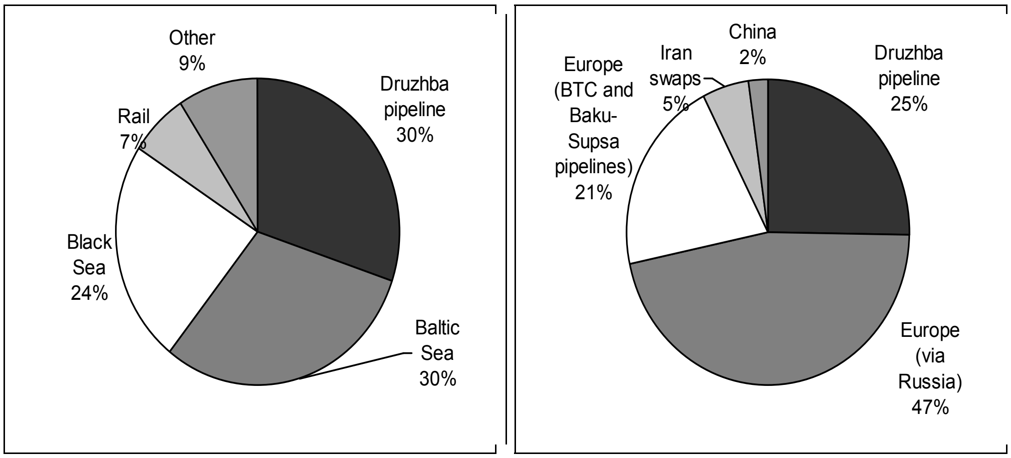
5.3.4.1 Oil

Russia

Russian oil export infrastructure is controlled by the state-owned monopoly Transneft. The only privately owned pipeline passing via Russian territory is the CPC from the Kazakh oil field of Tengiz to Russian Novorossiysk on the Black Sea coast. Russia has three major crude oil export routes to Europe. Firstly, the onshore Druzhba pipeline system (with two branches: southern and northern) runs through Belarus and transports crude to Central European countries and Germany (with links to Baltic States). In 2006, the Druzhba system accounted for around 30% of all Russian crude exports. The two other main outlets are maritime export routes via the Baltic Sea (Primorsk terminal) and via the Black Sea (mainly Novorossiysk in Russia, but also e.g. Odessa in Ukraine), accounting respectively for 30% and 24% of exports in 2006 (Figure 5.10). In recent years, due inter alia to the limited transport capacities of the Russian pipeline system (managed by Transneft) and difficult access to it, growing volumes of crude have been exported by rail (e.g. exports to China). Rail is also the most important medium in exports of Russian petroleum products – in 2005 almost 80% was transported in this way[76].

[76] Data: FSU Energy, 20.01.2006, Petroleum Argus.

Figure 5.10 Transport routes of Russian (left panel) and Caspian (right panel) oil exports, 2006 (% shares in total volume)



Source: Energy Intelligence (Nefte Compass, January 2007), own calculations.

To develop its export capacities and by-pass Belarus, Transneft has been working on increasing its Baltic Sea export potential (boosting Primorsk terminal capacities, building the Unecha-Primorsk oil pipeline, considering a new oil terminal at Ust-Luga, taking over control over oil terminals in the Baltic states: Latvian Ventspils and Lithuanian Butinge). There is a clear trend of increasing use of the Primorsk terminal, and declining volumes sent by the Druzhba system, so that since 2007 Primorsk has become the main outlet of Russian crude exports. Rising Black Sea export capacities are more problematic due to the overloaded Turkish Straits – here Russian oil companies, together with Bulgarian and Greek companies, are actively promoting a variant to bypass the Bosporus: the projected Burgas-Alexandroupolis pipeline (BAP). The project has advanced with the creation of a joint project company in January 2008 and the signature of an Inter-governmental Agreement between Bulgaria, Greece and Russia, although has not yet entered into the construction phase. The BAP can be seen competition to other regional pipeline projects: such as Samsun-Ceyhan, Burgas-Vlore (AMBO), Constanta-Trieste and Odessa-Brody – all aimed at facilitating the transport of crude via the Black Sea, but are at less advanced stages than the BAP.

Caspian region

The opening of the Baku-Tbilisi-Ceyhan (BTC), a large new export pipeline, increased the volume of Caspian oil transported via direct pipelines to international markets to above 20% in 2006. Russian pipelines (including CPC) still accounted for over 70%. Smaller volumes were reaching Iran and China, via other connections (Figure 5.10). Since 2006 the role of the BTC in Caspian crude exports has further increased. It is the first major (capacity of 50 Mt/y, in 2007 around 28 Mt was shipped) export route for CIS crude oil that is independent from Russia and that goes directly to the Mediterranean Sea (thus avoiding the Turkish Straits congestion problem).

There is an important difference in the current export patterns between the eastern and western coast of the Caspian Sea. In the east, Kazakhstan is the largest oil exporter and most of its crude – around 45 Mt per year – Is exported via Russia: partly through the CPC pipeline to Novorossiysk and further via the Black Sea to the Mediterranean, and another part through the Atyrau-Samara (Russia) pipeline, with smaller quantities sent by rail. Small quantities are sent to China via a new eastward pipeline opened in 2006 (the first such connection from the CIS region). Increasing volumes are also exported by sea to the Azeri Baku terminal (and further via rail or pipeline to Georgian Black Sea terminals) and to Iran (where swap deals are used). The import capacity of the main Iranian Caspian oil terminal in Neka is today about 6 Mt, but should be expanded soon to 7.5 Mt and further expansion is being considered (together with realisation of the Kazakh Caspian Transport System project).

The Kazakh export outlook may change in the near future as Astana is pursuing a policy of export route diversification. The country is continuing expansion of the Kazakhstan-China oil pipeline and is increasing its export possibilities to or via Iran (terminal expansion). Kazakhstan is also intensively trying to develop its exports westwards: pushing CPC expansion to the projected capacity of 67 Mt/y (expansion has being delayed by Russia), working on the Kazakh Caspian Transit System project[77] and considering stronger engagement in trans-Caucasian routes linking to the BTC but also Baku-Supsa and Baku-Batumi[78].

The second major Caspian oil producer – Azerbaijan – is selling most of its output westwards, primarily via the BTC.

5.3.4.2 Gas

Russia

The Russian gas export system is less diversified than it is for oil. The main route through Ukraine (with branches to Slovakia, Hungary, Romania and beyond) transits around 80% of CIS gas exports. There are two alternatives: Yamal-Europe through Belarus and Poland to Germany and Blue Stream to Turkey below the Black Sea accounting for around 20%. The Ukrainian route is estimated to have significant spare capacity (10-15 bcm, although the technical condition of the pipelines is uncertain) and may be expanded by up to 20-30 bcm, as Gazprom envisages, with a new line. There are also expansion plans by building parallel pipelines for both the Yamal-Europe (32 bcm) and Blue Stream (16 bcm) routes.

To diversify its export routes to Europe and bypass transit countries, Gazprom is planning to build two large new pipelines – Nord Stream and South Stream. The Nord Stream pipeline would directly link Russia with Germany (with a long offshore fragment from Russian Vyborg to Greifswald). The sub-sea stretch would consist of two legs each with a capacity of 27.5 bcm. The first is scheduled to be operational in 2011 and the second one around 2013. The project is being executed by the Swiss-registered Nord Stream AG, in which Gazprom holds a 51% interest, German BASF and E.ON hold 20% each and Dutch company Gasunie 9%. There is substantial uncertainty as to the final costs of the project, which may reach around EUR 9 billion for the offshore section. The project has been raising controversies in some EU member states for economic, ecological and political reasons, but it is already at an advanced stage of realisation.

The South Stream project is significantly less advanced that the Nord Stream and more concrete planning started only in mid-2007 with the agreement between Gazprom and ENI. It will link Russia to Bulgaria, with a 900 km off-shore Black Sea section from Russian Beregovaya to Varna

[77] An oil transportation project for the Kashagan field output, pipeline to the Kazakh shore (Aktau), terminals and tanker fleet are envisaged. The participants include ENI, Total, Royal-Dutch Shell, ConocoPhillips, KazMunayGaz, Inpex, ChevronTexaco ExxonMobil, KazMunayGaz, LukoilArco; estimated cost USD 3-4 billion USD. The planned transport capacity is in the range 25-38 Mt, and estimated completion time is around 2010.

[78] KazMunaiGaz (via its subsidiary KAzTransOil) owns the Georgian Batumi oil terminal.

in Bulgaria (planned capacity 30 bcm). The exact route of the onshore sections from Varna has not yet been finally decided (one leg is expected to go to Greece and Italy and the second to Hungary and Austria). In early 2008, Bulgarian, Greek, Serbian and Hungarian governments signed agreements on participation in the project. The project costs are hard to estimate at this stage and may reach around EUR 10 billion or more. The South Stream project has already caused substantial political controversies. It is seen as a competitor to the planned EU-backed Nabucco pipeline (see below).

If realised according the current plans, both projects would add around 85 bcm new export capacity to the EU markets as early as 2013-2015. Given that export volumes are unlikely to increase by that much it would allow a limiting of the flows through the already existing pipelines, thus significantly reducing Gazprom's dependence on transit through Belarus and to a much lesser extent through Ukraine. While precise cost estimates are not available it is nevertheless clear that these two projects are significantly more costly than alternative expansions of the Russian gas export infrastructure. This may give an indication of the pricing of the perceived "transit risk" associated with the current distribution of the export pipelines.

Apart from these projects Gazprom aims to build a pipeline to China with a capacity of around 30 bcm, although no concrete steps have been undertaken to realise this project. Another possible way of increasing Russia's export possibilities is entering the LNG market, especially by developing its own export terminals, but again this option has not advanced much so far (apart from acquiring majority shares in Sakhalin 2 project, including its LNG facilities, which should be built in 2008). The large prospective gas field Shtokman, which was originally scheduled to produce LNG, is now believed to eventually supply gas to the Nord Stream pipeline (at least in the early stages).

Caspian region

Most of the existing gas export routes from the Caspian region go northwards to Russia, with the Central Asia - Center (CAC) pipeline system being the most important outlet. Due to physical degradation and more recently on-going renovation works its capacity is currently around half of the original level, i.e. around 50 bcm. At present around 85% of Caspian gas exports is carried through Russia. The recent declaration of an opening of an additional link[79] from Turkmenistan via Kazakhstan to Russia (the so called Caspian pipeline) as well as renovating this export system – thus enabling designed capacity to be achieved – was signed in May 2007[80]. The other post-Soviet export route leading to Russia – Bukhara-Urals is currently practically out of use due to its poor condition. Small quantities of Caspian gas are exported to neighbouring countries (Kyrgyzstan, Tajikistan and south Kazakhstan).

There exist two pipelines outside the Russian territory for Caspian gas exports. Their present export capacity accounts for more than 25% of the region's total export capacity, but less than

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[79] The Caspian pipeline project (from Turkmenistan via Kazakhstan to Russia, regarded as competing with the Transcaspian project): modernisation of one of the existing branches of the Central Asia-Center gas pipeline system (CAC-3) and construction of a new one, total capacity unclear (20-30 bcm). No information is available on the project's resource base and costs. A declarative agreement between Russia-Kazakhstan and Turkmenistan was signed in December 2007.

[80] The signatories were presidents of Kazakhstan, Russia, Turkmenistan and Uzbekistan.

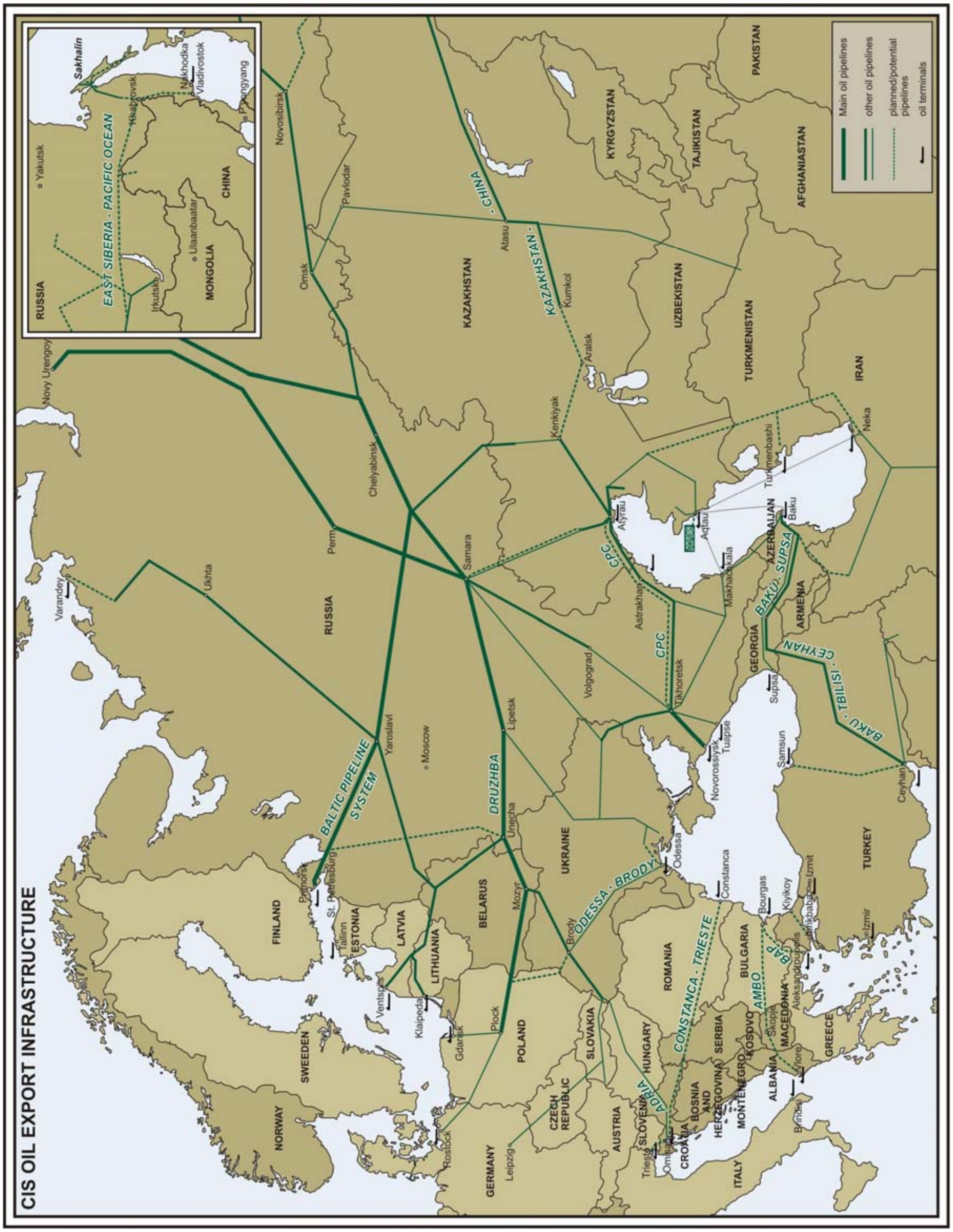
half of it is actually used[81]. Firstly, a gas pipeline from Turkmenistan to Iran (capacity: 8-14 bcm/y) was opened in the late 1990s. It accounts for less than 15% of annual gas exports from Turkmenistan, and its capacity is not fully used. Since January 2008, due to Turkmen-Iranian disagreements (most probably on gas prices), gas exports to Iran have been halted. Secondly, end-2006 saw the opening of the Baku-Tbilisi-Erzurum pipeline (BTE, also called the South Caucasus pipeline – SCP) with a capacity of 7 bcm. It was built by a consortium of companies led by BP and Statoil. Exports of Azeri gas via this pipeline reach Georgia, and since late 2007 have started flowing to central Turkey. Its regional significance could increase with the opening of connections to the EU markets (the Turkey-Greece gas interconnector, with a potential expansion to Italy by around 2012, or the Nabucco pipeline if it is realised – see below). If the outlets from Erzurum are secured, the capacity of the BTE pipeline could be increased to 16 bcm and possibly even to 30 bcm, becoming the major route for future Azerbaijani gas production (notably from the massive Shah Deniz field).

The importance of the planned Nabucco pipeline that would run from eastern Turkey via Bulgaria, Romania, and Hungary to Austria is related to the fact that at present the capacity of gas pipelines out of Turkey towards EU markets is significantly lower than the difference between the capacity of pipelines entering Turkey and domestic consumption in this country. Thus, the viability of any gas projects assuming supplies to Turkey depends on the existence of an extension that would transport gas to EU markets. The maximum capacity of the Nabucco pipeline (to be reached around 2020) is projected at 31 bcm, but probably only part of this would reach the Austrian gas hub Baumgarten, with the rest supplying the markets on route. Despite establishment of the Nabucco consortium back in 2004, and explicit backing for the project received from the EU and also the US, its realisation is still somewhat uncertain. If the South Stream project goes ahead, the rationale for Nabucco may be weakened.

2007 saw the start of construction of a gas pipeline from Turkmenistan to China (with a capacity of 30 bcm in Turkmenistan, probably increasing to 40 bcm in Kazakhstan). If successful this would make China a second major market for Caspian gas.

The westwards expansion of export options for the gas from the eastern side of the Caspian Sea would require either a continued reliance on Russia as a transit country or a connection via Iran and Turkey (which would in particular involve increasing the capacity of the existing pipeline between Turkmenistan and Iran) or the Transcaspian pipeline connecting Turkmenistan and/or Kazakhstan to the existing BTE pipeline in Azerbaijan. This would contribute to further diversification of export routes from the region, but realisation will likely be difficult. The problems are both of a political (e.g. the status of the Caspian Sea) and economic nature (availability of gas, sources for financing large infrastructure projects, etc.). Yet another option that was discussed at some stage was a Trans-Afghan gas route from Turkmenistan to Afghanistan, Pakistan and possibly India (TAP) but its realisation is unlikely in the medium-term unless the situation in Afghanistan improves considerably.

[81] Own estimates based on the news agencies information of use in 2007.


CIS OIL EXPORT INFRASTRUCTURE
Main oil pipelines
other oil pipelines
planned/potential pipelines
oil terminals
RUSSIA
EAST SIBERIA - PACIFIC OCEAN
Yakutsk
Sakhalin
Khabarovsk
Nakhodka
Vladivostok
Pyongyang
Irkutsk
Ulaanbaatar
MONGOLIA
CHINA
Novy Urengoy
Novosibirsk
Pavlodar
Omsk
KAZAKHSTAN - CHINA
Atasu
KAZAKHSTAN
Kumkol
Aralsk
Kenkiyak
Chelyabinsk
Perm
Ukhta
Varandey
Samara
Atyrau
CPC
Aqtau
Astrakhan
Makhachkala
Baku
Turkmenbashi
Neka
KYRGYZSTAN
TAJIKISTAN
PAKISTAN
AFGHANISTAN
UZBEKISTAN
TURKMENISTAN
IRAN
AZERBAIJAN
BAKU - SUPSA
ARMENIA
GEORGIA
Supsa
BAKU - TBILISI - CEYHAN
Tikhoretsk
Volgograd
Novorossiysk
Tuapse
Samsun
Ceyhan
TURKEY
Lipetsk
Yaroslavl
Moscow
BALTIC PIPELINE SYSTEM
DRUZHBA
Unecha
Mozyr
UKRAINE
ODESSA - BRODY
Odessa
Brody
Primorsk
St. Petersburg
FINLAND
Tallinn
ESTONIA
LATVIA
Ventspils
LITHUANIA
Klaipeda
BELARUS
Gdansk
Plock
POLAND
Constanca
CONSTANCA - TRIESTE
ROMANIA
Bourgas
Kiyikoy
Izmit
Izmir
BULGARIA
AMBO
BAP
Aleksandroupolis
MACEDONIA
Skopje
GREECE
Vlore
ALBANIA
KOSOVO
SERBIA
MONTENEGRO
BOSNIA AND HERZEGOVINA
CROATIA
Omisalj
ADRIA
SLOVENIA
Trieste
HUNGARY
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Rostock
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NORWAY
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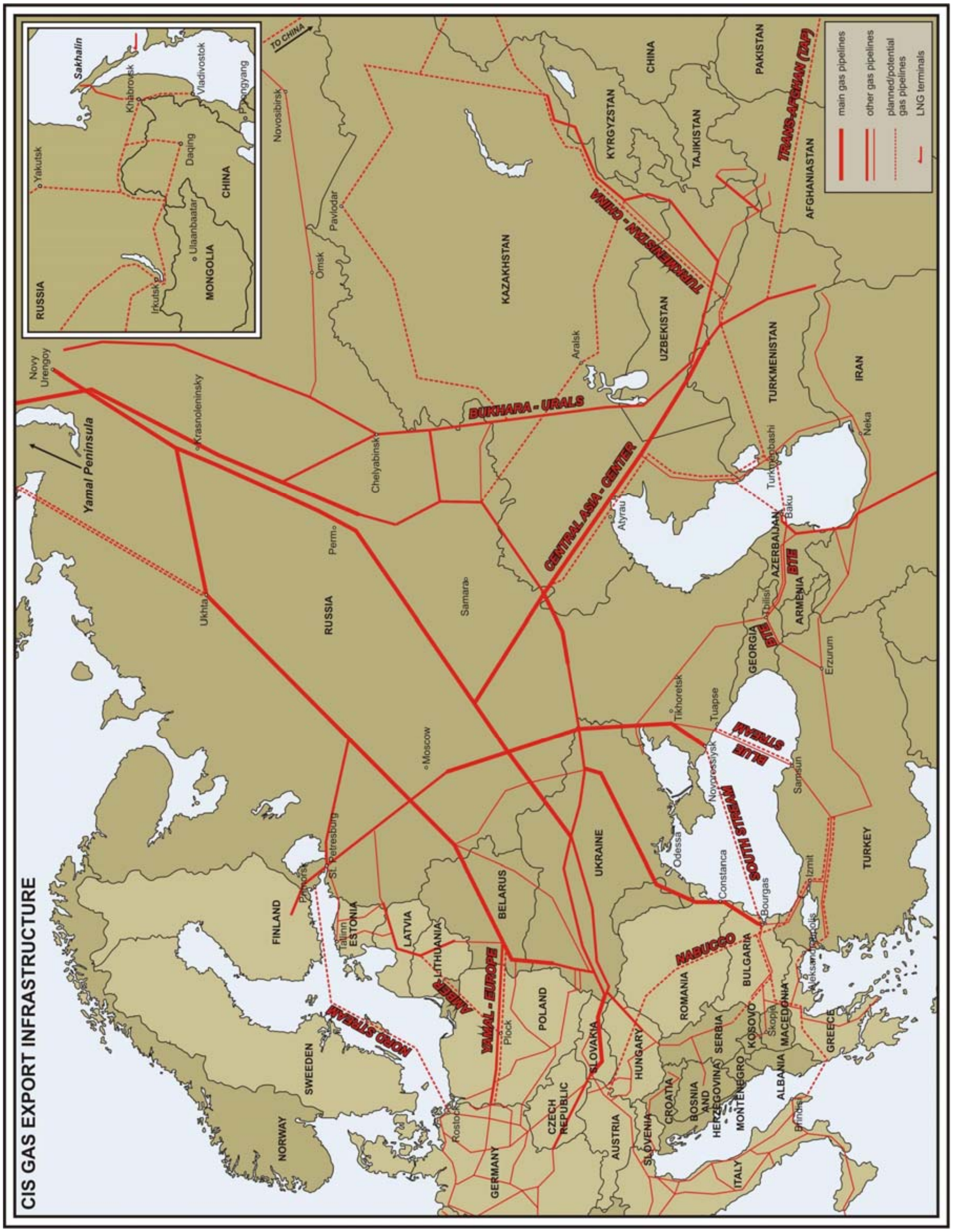
CIS GAS EXPORT INFRASTRUCTURE
main gas pipelines
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LNG terminals
Yamal Peninsula
TO CHINA
RUSSIA
Sakhalin
Khabarovsk
Vladivostok
Pyongyang
Yakutsk
Daqing
Irkutsk
Ulaanbaatar
MONGOLIA
CHINA
Novy Urengoy
Krasnoleninsky
Novosibirsk
Omsk
Pavlodar
Chelyabinsk
Perm
Ukhta
Samara
Moscow
St. Petersburg
Primorsk
KAZAKHSTAN
Aralsk
Atyrau
UZBEKISTAN
TURKMENISTAN
KYRGYZSTAN
TAJIKISTAN
AFGHANIASTAN
PAKISTAN
IRAN
Neka
Turkmenbashi
Baku
AZERBAIJAN
ARMENIA
GEORGIA
Tbilisi
Erzurum
TURKEY
Samsun
Izmit
Tikhoretsk
Tuapse
Novorossiysk
Odessa
Constanca
Bourgas
Aleksandroupolis
BUKHARA - URALS
CENTRAL ASIA - CENTER
TURKMENISTAN - CHINA
TRANS-AFGHAN (TAP)
BTE
BLUE STREAM
SOUTH STREAM
NABUCCO
YAMAL - EUROPE
AMBER
NORD STREAM
FINLAND
ESTONIA
Tallinn
LATVIA
LITHUANIA
BELARUS
UKRAINE
POLAND
Plock
ROMANIA
BULGARIA
GREECE
MACEDONIA
Skopje
KOSOVO
SERBIA
ALBANIA
MONTENEGRO
BOSNIA AND HERZEGOVINA
CROATIA
SLOVENIA
HUNGARY
SLOVAKIA
CZECH REPUBLIC
AUSTRIA
ITALY
Brindisi
GERMANY
Rostock
NORWAY
SWEDEN

5.4 Legal aspects of gas trade and transit

5.4.1 The specific characteristics of the gas market in Europe

The market for natural gas has certain specific features distinguishing it from the oil market and markets of other commodities. The crucial point is that gas is difficult to transport. Thus, there is no global gas market, nor a global price for gas. There are separate regional markets, of which Europe (together with the CIS area) is the largest. Gas can be transported by two methods – either by pipelines or by tankers built to carry gas in liquid form (LNG)[82]. As far as CIS gas is concerned only pipeline transport is currently an option. This implies large fixed costs of the transport infrastructure and very limited possibilities of changing transportation routes – both from the perspective of buyers and sellers.

These specific features of gas and its markets are reflected in the types of contract prevailing in the European market and applied pricing formulas, or – from another perspective – the degree of energy market liberalisation can be verified by the changing types of contracts prevailing in energy trade in Europe.

5.4.2 Contract types in gas trade

Gas sales agreements often contain take or pay clauses. In this way the purchaser of gas assumes the obligation to "take" a specific volume. This means that whether or not the purchaser "takes" the volume, it has to pay the price agreed for it. These clauses mitigate the supply risk of the producer by guaranteeing the purchase of specific volumes from the project. The purchaser thus assumes the market risk of the product. Another type of clause that was used in the past is the destination clause, which were used in contracts for the supply of Russian gas to the EU. Destination clauses basically exclude the possibility that the purchaser resells the gas and restricts its use to specific areas (Greti and Villeneuve, 2003; Neuhoff and Hirschhausen, 2005). As the result of a DG Competition enquiry in 2000, destination clauses were progressively abandoned in new gas contracts (e.g. those concluded by E.ON, OMV, ENI).

Gas is traded on short-term, long term and spot contracts. Long-term contracts have been widespread since upstream and downstream natural gas infrastructure projects are very capital intensive and their financing usually requires long-term purchase agreements (Oviedo, 2006). Long term take-or-pay contracts link sellers and buyers for extended periods, typically up to 15-20 years, with strictly defined obligations for both sides. The advantages of this scheme include the possibility of avoiding risks of opportunistic behaviour, guaranteeing that the project investor has a certain amount of revenue flows to repay debt and setting the price formula for gas delivery and quantity. The main drawback of simple long-term contracting is inflexibility in the face of demand and supply fluctuations. To mitigate this problem, parties therefore stipulate specific clauses, notably on prices[83]. In Europe and Asia, price indexation to aggregated oil and oil

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82 Another technology, compressed natural gas (CNG), has being developed. It is similar to LNG but uses standard compressor equipment to load special ships that can unload directly into the existing gas transmission pipelines (given similar pressure).

83 Information on prices which are agreed in long-term contracts is of a confidential nature. Basic prices, as well as how they are set and the indexation to prices of other fuels are defined in the process of preparing a concrete contract. Pricing formulas may also depend on practical terms of delivery, as well as the structural, fiscal and energy price conditions of a country.

products prices (heavy fuel oil and motor fuel), as well as coal, as alternative fuel is used to protect the buyer of gas on a long term basis.

Long-term contracts used to finance upstream and downstream infrastructure projects can also have a market foreclosure effect. Such market access barriers may be difficult to tackle by national competition authorities.

The European Commission aims to gradually liberalise the internal EU gas market with more short-term and spot trade, auctions and third party access to the pipelines – the formation of gas hubs, where prices reflect the balance of demand and supply. Essential distortions of gas prices from alternative fuels are explained by external conditions (abnormally warm or cold winters) and/or by the lack of infrastructure capacities. The analysis of specific modes of liberalisation and its consequences have been subject to heated debates within the EU (e.g. on the European Commission's third liberalisation 'package' proposals from 19 September 2007).

In very broad terms, the EU's attempts to liberalise energy markets contradict Russian economic policy, which is aimed at the strengthening of national vertically integrated energy monopolies and their growing influence on the European market. In any case, given the currently binding long-term contracts for Russian gas (see Table 5.2 and ECA et al., 2007) they will remain the main mode for deliveries of Russian gas to the EU at least until around 2030.

In gas trade in Europe and in gas contracts with Russia, the pricing concept for gas is based on a netback value calculated on the basis of the value of competing energies backed to the border of the buyer's country by deducting the buyer's costs of transportation and distribution (for an in-depth discussion see Energy Charter, 2007). Referring to the netback concept, Gazprom currently justifies its need to increase prices for CIS countries and for bring them closer to European prices (for price developments in intra-CIS gas trade see Chapter 3).

Long-term contracts, price indexation formulas based on oil prices (rather than gas), the closed character of the contracts and real or perceived transformation of gas from simple commodities into political commodities, resistance to liberalisation from the European national energy monopolies and the Russian side all make progress in real de-monopolisation in Europe very difficult. The difference between extraction (and transportation) costs and consumer tariffs has been growing. Gas delivery is much more difficult to diversify, while gas itself plays an increasingly important role in many national TPES. As a result, the current situation with gas prices (due to existing gas contracts) suggests that monopoly rent is generated on net consuming markets.

5.4.3 Transit regulations

There are currently no efficient mechanisms regulating transit issues that could be applied to Russian gas exports to the EU. CIS transit countries have in some instances demonstrated their ability to break their own agreements (one recent example is the January 2008 declaration of Ukrainian prime-minister Timoshenko of a planned fivefold increase in transit tariffs for Russian gas)[84]. Absence of legal mechanisms that would secure Russian transit through CIS territory (but also Caspian transit through Russia's territory) increases the risks of possible transit interruption or instability.

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[84] See The Moscow Times, January 22, 2008.

The safety of energy transit from Russia to the EU has been questioned by some observers since 2005, when the Russian-Ukrainian gas dispute (2006), Russian-Belarusian gas (February 2005) and oil conflict (at the beginning of 2007) took place. Due to disagreements on import prices and certain political tensions and ambiguities in their gas agreements, these countries were accused by Russian energy companies of siphoning off oil and gas from the transit pipelines for their own needs. It turned out that both sellers (Russia) and buyers (EU countries) were unable to effectively influence transit actors.

Among the key trends affecting transit issues one can list:

- Mixing up of energy transit and internal deliveries (barter in energy trade; re-export issues) and misuse of 'transit power' by some transit countries,
- Russian attempts to by-pass current transit countries with new oil and gas pipelines,
- Russian attempts to gain control transit and transmission assets in transit and downstream markets,
- Political interference in economic decision-making (this affects all sides, including the EU).

From a global perspective, this picture is clearly part of a sub-optimal adjustment to the gas transit realities and involves substantial deadweight losses. In the ideal world, effective implementation of some international legal instruments could provide a viable solution. In the next sub-section we therefore look at available international frameworks that could be useful in this respect.

5.4.4 International and multilateral agreements

WTO

Most CIS countries intend joining the World Trade Organisation (WTO), but progress in accession procedures varies greatly. As of 2008, WTO members include Armenia, Kyrgyzstan, Moldova, Georgia and Ukraine (which joined in May 2008). Azerbaijan, Kazakhstan, and Russia could also become full members of the WTO in the near future.

WTO membership sets some standards for the energy sector. The WTO provides regulation of trade in energy goods, although the WTO transit clause seems too weak to impact much on gas trade in the CIS. The determination of internal prices is not subject to WTO regulation, although the competitive structure of the domestic market may be (and is in Russia's case) a matter of negotiation as an accession condition. Thus for CIS countries accession to the WTO implies (in line with negotiated provisions) a gradual increase in internal prices for gas and electricity, including in Russia (which in any case has a schedule for domestic price increases). Also, it requires elimination of direct subsidies to producers and abolishing cross-subsidisation (a practice that occurs in many CIS countries). Therefore, WTO accession has a certain positive influence on changes in regulatory policy within the energy sector. It also provides some kind of guarantee for foreign investors and investments in terms of fair 'rules of the game'.

As for access of foreign companies to mineral resources surveying and extraction, the WTO does not play any relevant role. Within the WTO, discussions are taking place about the rules for foreign companies' participation in the services related to exploration and extraction of mineral resources as one of the segments in the service sector.

ECT and Transit Protocol

Most CIS countries have signed the Energy Charter Treaty (ECT), which sets international standards for international commerce in the energy sector. Armenia, Azerbaijan, Georgia, Moldova, Kazakhstan, Kyrgyzstan, Turkmenistan, Ukraine and Uzbekistan have already ratified the ECT, while Belarus and Russia have signed but not ratified it. Belarus is postponing ratification, trying to gain optimal benefits and has been winking at both the Russian and the European positions.

The ECT assumes energy trade on WTO principles, investment protection in the post-investment stage from different non-economic risks and guarantees profit repatriation. Apart from these, it regulates transit and issues related to energy efficiency. Crucial for the EU is effective application of ECT rules on investment and transit, in particular the possibility for an investor to ask for arbitration in the case of an unresolved conflict. In an attempt to strengthen the applicability of the GATT/WTO principles of freedom of transit, and to facilitate transit on a non-discriminatory basis the ECT initiated a discussion on the Transit Protocol aimed at strengthening the ECT's provisions on transit issues. The provisions that should be put in the Transit Protocol quickly became a controversial issue between the EU and Russia. To date no compromise has been reached on the final text of the protocol.

Some of Russia's reluctance to ratify the ECT is related to its unwillingness to give a third party access to gas transmission pipelines in Russia to transit Caspian resources, especially Turkmen gas. Table 5.1 briefly presents some of the key arguments that have been raised by Russia and advocates of the ECT that are related to the potential implications (real and perceived) of a Russian ratification of the ECT.

Table 5.1 Possible pros and cons of ECT ratification by Russia

Russian (Gazprom) arguments	ECT advocates *(see also Box 5.2 below)*
ECT provision on free and competitive access to transit pipelines will increase the transit of Caspian gas across Russia to Europe, directly competing with Russian gas. Ratification will open the door for Turkmen gas travelling via Russian existing pipeline capacities, at inexpensive Russian domestic tariffs, to Western countries.	The ECT does not oblige a transit nation to provide its capacities for transit. However, it states that if the access is provided, it should be done on non-discriminatory terms. The ECT does not regulate and does not interfere with transit tariffs for gas extracted in Russia and does not demand access to Asian gas transit. Besides, it does not require the access to Russian fields.
Transit Protocol does not work in the EU (considering the EU as a single market), implying that e.g. Russian gas transited through Poland to Germany would not be governed by Transit Protocol while Asian gas through Russia to Europe would be (Russia finds this unfair). Norway has not ratified the ECT and the EU does not seem to be pressing it at all.	The ECT provides legal instruments for transit regulation (legal protection of Russian exports) Possibility to enjoy European domestic tariffs (domestic regime for trade and transit that EU members established for themselves)

It increases system risks and uncertainty of gas market development (according to some Russian experts, the restrictions on long-term contracts on European markets (which ECT ratification would imply) would hamper Russian gas business, as its gas fields require large investments that can only be guaranteed under long-term contracts)	The ECT does not forbid long-term contracts, nor it imposes any purchase obligation at EU border. The ECT would decrease system risks, as it would set identical legal obligations, which would provide a minimal standard of non-discrimination.
The treaty will fail to improve the investment climate It will not attract more FDI in the Russian gas sector	The ECT provides a favourable investment regime that could help foreign investments in the Russian energy sector

Sources: Own elaboration based on various internet sources.

Box 5.2. Extracts from the Energy Charter Treaty web site

Does implementation of the Energy Charter Treaty mean mandatory third party access to pipelines and energy networks?

The Treaty includes an obligation on member countries to facilitate energy transit across their territory, in line with the principle of freedom of transit, and an obligation to secure established transit flows. At the same time, an understanding included in the Treaty makes it clear that the Treaty provisions "do not oblige any Contracting Party to introduce mandatory third party access".

Negotiations on an Energy Charter Transit Protocol aim to clarify the operational meaning of 'freedom of transit' for the energy sector, on the basis of the existing Treaty provisions. The overall aim is to provide clear and transparent rules for international energy transit flows, which can encourage the efficient development and use of energy transportation infrastructure and reduce the risk of interruptions to supply.

Does the Energy Charter Treaty require unbundling/privatisation of state-owned energy assets?

An objective of the Treaty is to promote transparency and efficiency in the operation of energy markets, but it is for governments to define the structure of their national energy sector. There is no obligation to privatise state-owned energy companies, or to break up vertically integrated energy companies.

Does the Treaty oblige countries to provide foreign investors with access to their national energy resources?

While the Energy Charter is based on the idea that international flows of investments and technologies in the energy sector are mutually beneficial, national sovereignty over energy resources is a core principle of the Treaty (ECT Article 18). Each member country is free to decide whether and how its national energy resources are developed, and also the extent to which its energy sector is open to foreign investors.

Source: Extracted from the Energy Charter Secretariat website (www.encharter.org/index.php?id=18&L=0).

Besides the above listed issues there also appears to be a consensus that the key issue requiring further work is the decision on how, and to what extent, the Protocol could include mechanisms helping to establish long-term transit arrangements where these would be needed and in particular in connection with prevailing long-term supply contracts[85].

The Transit Protocol remains a difficult topic in the dialogue between Russia and the EU due to the specific geographical location of Russia. For example, energy transit issues are not highly relevant to Norway, but are crucially important for Russia as Russian gas crosses the borders of several countries before reaching Western Europe. The share of direct delivery from Russia to neighbouring countries in total Russian exports to Europe is around 40%, compared to around 50% in Algeria, 66% in Norway or 75% in the Netherlands. Russian gas typically goes through three or four countries (ARETT, 2004).

A number of misunderstandings have arisen in the debate on the ECT ratification and Transit Protocol between EU and Russian stakeholders and commentators. The interpretations of some articles (e.g. on third party access and transit tariffs) vary. Some experts in Russia assume that Transit Protocol (in the current state of the draft of this document) would oblige Russia to sell gas only to the EU border, while a further transit regime (e.g. through Poland or Slovakia) would not be guided by norms of Transit protocol but by internal EU legislation. On the other hand, some EU actors have limited their interest in the issue to postulating that Russia is ratifying the ECT and the Protocol without investing any effort in understanding what is at stake (or indeed that there simply is no final version of the Transit Protocol).

Russia does not deny the importance and necessity of the ECT (and its draft Transit protocol). However, due to different visions on principles in energy co-operation, until the two sides find compromises on all issues Russia will not ratify the ECT in its current form.

As far as Russia-CIS transit countries are concerned, one important process is the gradual increase in gas import prices, potentially towards European levels (actually Russia itself is planning to shift to "world prices" from 2011). The second trend, alongside the ECT regulations, is decoupling transit rules from sales contracts. Thus, the prices of Russian gas deliveries to CIS partners would rise, while transit fees would be likely to stay constant (e.g. the five-year contract between Gazprom and Ukrainian Naftogas fixed gas transit tariffs at USD 1.6 per tcm per 100 km). Another step towards more transparent pricing and market-based rules is the Russian decision to exclude barter or clearing schemes. For example, until 2005 Russia delivered to Ukraine 30 bcm as a payment for transit. Since 2005 the transit is paid in cash. In Belarus, Russia transfers USD 625 million in cash annually as a payment for a 12.5% stake in Beltransgas, despite a Belarusian offer of a scheme where this money would be accounted as a partial payment for gas.

There remain certain tensions related to current legal aspects of the energy trade between the EU and Russia (and to a lesser extent with other CIS countries). Tensions between internal gas market liberalisation efforts and the dominant types of contracts with Gazprom are likely. There is a rather limited set of international instruments to accommodate these issues. The potential role of the ECT (and the draft Transit Protocol) as the only legal instrument on handling energy transit and trade is often overestimated, neglected or misunderstood by various parties. Still, the alternatives to the ECT are rather limited, although some WTO provisions (see above) and in particular deep free trade agreements (FTA) could provide some solutions.

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[85] See the statement of the Chairman of the Energy Charter Conference in July 2006 available at http://www.encharter.org/index.php?id=37.

5.5 EU partnership with CIS energy producers

5.5.1 EU-Russia energy relations

The EU has developed an institutionalised framework of energy relations with Russia, more developed than with other CIS hydrocarbon producers. The EU-Russia energy dialogue has been the most visible platform for such relations since its establishment in 2000. Nonetheless, bilateral energy relations between Russia with both EU member states and energy companies of EU origin have remained prominent. This can be explained by the fact that Russia is and will stay a strategic economic partner and the primary source of energy for the EU, but is also a result of a long tradition (since the 1970s) of such relations. The most visible and characteristic is cooperation in the gas sphere, so this part of the text will be devoted to Russia's gas relations with EU member states and EU-based companies.

There is much less of a threat of direct politicisation of Russia-EU gas relations than one could expect from the rhetoric of officials. Still, some limited negative spill-over effect in the case of problems in Russia's relations with CIS transit countries could affect relations between Russia and the EU, or more specifically East European EU countries that rely on Russian / CIS gas for most of their supplies (see section 5.2). While the overall picture of gas relations may be more rational and normal than portrayed in some media and by some politicians, it is nevertheless true that gas relations Russia-EU are not limited to the business level only.

EU-Russia government relations

In the CIS, Russia has been the primary focus of energy relations and cooperation for EU governments. Nonetheless, Caspian States are becoming increasingly important, in particular for countries whose companies have invested massively in the region (e.g. Italy and the UK).

The energy relations of specific countries with Russia are usually of a dual nature: both business/commercial and political. This is especially true when it comes to gas: Russian gas exporting company Gazprom is controlled by the state (51% stake) and very closely connected with the ruling elite[86]. In its actions it is pursuing its own commercial interests but also acts in both the economic and strategic interests of the Russian state. Most of Gazprom’s actions can be described as economically or strategically rational, although its economic or strategic interests would have to be defined differently from those of a western energy company (with the key difference being related to the close inter-linkages between the commercial interest of the company and Russian political interests). Non-transparent gas trade schemes involving intermediaries such as RosUkrEnergo also need to be taken into account.

Important energy deals are decided or at least discussed at the political level and often contribute to a deepening of bilateral political relations between countries (e.g. in the case of Russian relations with Germany and Italy). The StatoilHydro participation in developing Russian Shtokman gas deposits was confirmed by President Putin in a telephone conversation with the Norwegian prime minister in September 2007. During 2006 a number of intergovernmental meetings between heads of major European natural gas importing countries and Russia (e.g. several meetings between president Putin with German Chancellor Angela Merkel and Italian

[86] As an example, Dmitry Medvedev, Chairman of the Board of Directors of Gazprom since 2000, at the same time serving as a Chief of Staff of the Presidential Executive Office from October 2003 to November 2005, before becoming First Vice Prime Minister in 2005. In March 2008 he won the presidential elections.

prime minister Romano Prodi) - were translated into prolongations of long-term gas supply contracts with the respective countries (most of them accompanied by extra provisions for Gazprom (see Table 5.2.). Thanks to these deals, the respective EU countries have secured supplies of about 100 bcm per annum for the next two decades or so, i.e. almost 20% of current EU consumption. These deals mainly extended already existing long-term contracts (many of which were to expire within the next 5 years or so). At the same time Gazprom has succeeded in entering, as a distributor, the internal gas markets of a number of EU countries.

EU/Russia business level relations

Presently, the EU's most important Russian partners when it comes to gas relations are German, Italian and French companies (at the same time the biggest EU gas importers and together accounting for a major part of Russian gas exports to the EU) – see boxes 5.3-5.6, but also companies from other EU countries such Bulgaria and Hungary. 2006 brought new developments in these ties. German companies (E.ON, BASF), traditionally the strongest partners of Gazprom, were followed by Italian ENI (a strategic partnership agreement with Gazprom) and French Total – chosen as the first partner (later joined by StatoilHydro) in the development of Russia's large new gas field – Shtokman. Gazprom has entered the retail gas market in these countries (see Table 5.2). 2006 also brought advancement in Gazprom's relations with new partners in EU gas producing countries – Dong Energy, Fluxys, Hydro or Gasunie (gas supply agreements, Gazprom subsidiaries registered, etc. – see Paszyc, 2007).

Developing strong economic and political bilateral ties serves the interests of both sides. European actors get firmer relations with the EU's biggest neighbour and the world's largest gas supplier, which is especially important in the context of shrinking internal production. Additional and exclusive guaranties of security and stability of supplies started to be sought in Europe after the early 2006 Ukraine-Russia gas crisis and brief interruption of Russian gas supplies. It is quite natural that EU countries and companies are also strongly attracted by the prospect of access to Russia's oil and gas deposits and joint investments. Gazprom gets political, financial and technological support in the realisation of its strategic energy goals in Europe (including projects for the gas pipelines - Nord Stream and South Stream) and the possibility of entering the EU's gas distribution market. Bilateral relations with specific countries and separate agreements (e.g. on gas prices, access to Russian oil/gas deposits or investments in other sectors like electricity[87]) with the main partners partly undermine the development of a strong and effective common energy policy at the EU level.

Table 5.2. The most important long-term contracts concluded in 2006 by Gazprom with EU companies

Country	Contract duration	Supplies (bcm/year)	Provisions
Austria	2012-2027	7 bcm	2 out of 3 gas distributors are Gazprom's subsidiaries Access for the same subsidiaries to Austrian final market
Germany (E.ON)	2009-2035	8 bcm till 2020 20 bcm after 2020	

[87] Two important Russian power generation companies were partially sold to Enel and E.ON in 2007 (see Chapter 6).

Country	Contract duration	Supplies (bcm/year)	Provisions
Germany (E.ON)	2011-2036	4 bcm (Nord Stream)	
Germany (VNG & WIEH)	2014-2031	5.2 bcm (possible increase)	
Italy (ENI)	2017-2035	22 bcm	Gazprom gets access to Italian retail market (sale up to 3 bcm/y)
France (Gaz de France)	2012-2030	12 bcm + 2.5 bcm (Nord Stream)	Gazprom gets access to French retail market (1.5 bcm/y) via its subsidiary GMT
Czech Republic (Transgas/RWE)	2014-2035	9 bcm	
Bulgaria	2011-2030	3 bcm	Overgas, a Gazprom subsidiary, is the dominant gas distributor
Romania (WIEH)	2012-2030	4.5 bcm	
Romania (Conef)	2010-2030	2.5 bcm	
Denmark (DONG)	2011-2031	1 bcm	

Source: Based on Paszyc (2007).

Bilateral relations have been strengthening lately in spite of (or maybe because of) the worsening climate for foreign investments in the Russian energy sector. Difficulties on Russia's internal market have also hit the interests of Gazprom's strategic allies (e.g. Total had problems in the Kharyaga field) and indicate a change in rules of the game when it comes to operating in the gas sector. In 2006, the Russian government confirmed Gazprom’s dominance in the domestic gas market and monopoly over exports. The company is to have the controlling (or at least blocking) stake in all strategic gas deposits, which implies increasing state control over the sector. This objective has been realised at the expense of foreign investors already operating in Russia (in Kovykta, Sakhalin, etc). In 2007, a list of strategic gas deposits was introduced, where no tender procedures are required and the authorities can nominate operators, which is seen as another measure de facto strengthening the position of Gazprom. The changing investment conditions have set a difficult framework for foreign companies’ objective of getting access to Russian gas deposits. Thus, close cooperation with Gazprom might appear to be the only way for EU companies of getting into the Russian internal energy sector, although it is unsure whether this way would guarantee stability of investment.

Box 5.3. Russian-German gas relations

Germany is the single biggest importer of Russian gas and German companies (E.ON and Wintershall/BASF) have a long tradition of strong relations with Gazprom in that they:

- Created several joint ventures with Gazprom (i.e. Gerosgaz with E.ON Ruhrgas, Wingas with Wintershall which are trading Russian gas),
- Realise jointly (51% - Gazprom, 20% - E.ON, 20% - BASF) the most important Russian gas pipeline export project Nord Stream. Former German Chancellor G. Schroeder chairs its Supervisory Board,

- Commonly own energy assets in the EU (Baltic States' gas companies, but also Wingas assets in Germany),
- Cooperate on third markets, with examples being a Ruhrgas-Gazprom agreement from 2001 on coordination of actions related to privatisation in the gas sector in Central Europe (initial plan with GdF in Slovak SPP privatisation, which was finally done without Gazprom), selling Russian gas on retail market – via Wingas Europe, etc.,
- Exchange assets in Europe and abroad,
- Entered or are about to enter Russia's gas exploration business (BASF holds 35% shares in Russian gas deposit Yuzhnorusskoye,
- E.ON has a share in Gazprom (6.5%) and has a member at Gazprom's Board of Directors.

Box 5.4. Russian-Italian gas relations

Italy is also one of Russia's main partners in the energy sphere and the second biggest importer of its gas. Since 2005 there has been a visible intensification of Russian-Italian relations and enforcement of Gazprom partnership with ENI. Partners co-operate in that:

- Italy has been importing Russian gas since the late 1960s,
- They realise strategic pipeline projects together (Blue Stream – commissioned in 2005; planned South Stream)
- They cooperate on the Russian energy market (ENI bought post-Yukos assets in 2006 with an option to resell most of them to Gazprom) and in other markets,
- They signed strategic partnership agreements (first in 1998, a more recent one in 2006),
- Gazprom got (2006) access to Italian final consumers for sales reaching 3 bcm in 2010

Box. 5.5 Russian-French gas relations

France has been importing Russian gas for more than 30 years now, which currently covers about 25% of the country's gas demand. The most important Gazprom's French partners of Gazprom are Gaz de France (GdF) and Total. One can list the following examples indicating the strength of co-operation:

- Joint company French-Russian FRAGAZ Trading gas (50% Gazprom, 50% GdF),
- Gazprom got access (2006) to French final consumers for sales of 1.5 bcm from 2008,
- Cooperation in LNG trade (GdF swap deals with Gazprom),
- Possible acquisition of GdF shares by Gazprom,
- Total's participation in Russian hydrocarbons development (Shtokman gas field, Khariaga oil field, possibly also Astrakhan gas field),
- Initial project for a joint GdF/Gazprom ownership in the Slovak gas pipeline operator, SPP.

Box 5.6 Russian-Hungarian gas relations

Hungary, and its oil and gas company MOL, are traditionally good partners of Russia and Russian companies in Central Europe in that:

- Gazprom and MOL jointly own Panrusgas, a gas trading company, that imports Russian gas in Hungary (Gazprom is the main gas provider to Hungary with about 35% of total primary energy supply),

- There is cooperation in the development of strategic gas pipelines (intergovernmental agreements on Blue Stream II pipeline in 2006 and South Stream in 2008) and other infrastructure (joint venture to build an underground gas storage in Hungary),
- MOL invested in Russia's oil exploration in Western Siberia (Zapadno Malobalik and Surgutsky-7 oilfields) in 2003 via Hungarian-Russian joint venture,,
- Lukoil and Rosneft supply MOL's refineries in Hungary and Slovak Republic
- Gazprom holds stakes in the main Hungarian oil/petrochemical companies (BorsodChem and TVK),
- There is cooperation in the Hungarian nuclear sector,
- A former intermediary in Russia-Ukraine gas trade EuralTransGas was registered in Hungary; Emfesz, an offshore gas trader linked with RosUkrEnergo, is established in Hungary and active there and in Poland.

5.6 Perceived and real risks related to CIS energy exports – the EU perspective

The USSR and then Russia have been the key source of hydrocarbon imports to the EU, helping to counterbalance a heavy dependence on OPEC in oil and securing stable supplies of gas. Geographic proximity, the size of CIS resources and established transport infrastructure have all contributed to the relatively low costs of energy supplies. Russia has also been a stable and reliable partner in oil and gas trade amid internal problems (e.g. crisis of 1998) and global fluctuations[88], with rare exceptions in recent years (especially the 2006 Ukrainian-Russian gas crisis). Russia has become the EU's single most important energy partner. Its role may possibly grow even further, given the country's potential of satisfying growing EU energy import needs in the future. Another CIS energy producing region – the Caspian – while significantly less important in terms of prospective volumes, may nevertheless provide substantial additional oil and gas supplies to the EU, and also allow for increased geographical diversification of imports (only recently, so far relatively small some volumes of oil and gas have reached EU markets).

At the same time there exist some challenges and risks connected with CIS (mostly Russia) energy (mostly gas) exports to the EU. The likelihood of their materialisation and potential consequences differ considerably. The most important issues can be summarised as follows.

- A slowdown in Russian oil and gas output growth – sustainability of export volumes

  The recent slow pace of growth in output is mostly a result of underinvestment in existing and new deposits development and restrictive policy towards investments in the oil and gas sector. This is particularly the case of upstream gas where the three very large fields (Medvezhye, Yamburg and Urengoy) continue to decline. At the same time, Russian companies are heavily investing in building and controlling export facilities, trading and downstream (distribution). This trend, combined with huge internal energy demand and low efficiency of energy use, may create a supply gap that would then need to be filled by supplies from the Caspian region. The possible emergence of alternative markets (Asia, the US) for Russian (but also Caspian) hydrocarbons could add to these tensions. Also, the persistence of restrictions on foreign investments and poor protection of property rights,

[88] See http://ec.europa.eu/energy/russia/overview/objectives_en.htm.

although at present not limiting the interest of foreign companies, may ultimately limit the available financing for new upstream projects in Russia and Kazakhstan.

- Possible disruptions in energy supplies

Difficult relations between Russia and CIS transit countries constitute one of the main reasons for such potential disruptions. The cases of recent problems (the Russian-Ukrainian gas dispute in early 2006 and Russian-Belarusian oil dispute in early 2007), which briefly also affected EU energy imports, threatened Russia's reputation as a stable and reliable supplier to the EU. The poor technical shape of transport/transit infrastructure in both Russia and CIS transit states could also lead to short-term disruptions (e.g. the blast at one of the Ukrainian gas pipelines in December 2007[89]).

- The challenges for EU energy market liberalisation

    - **Contractual arrangements** with the prevalence of long-term contracts could make the already difficult path to gas market liberalisation yet more complicated.
    - The possible **dominant position of Gazprom in the EU gas market**. The company is trying to increase its control of all links along the gas chain, including entering the European downstream. Such attempts have intensified in the last few years. Possible abuse of its dominant position and indirect pressure on EU countries (e.g. unexplained reduction of Russian gas supplies to Italy in 2006 in parallel to ENI/Gazprom negotiations on gas supply contract and presumably on Gazprom's access to the Italian market, and joint upstream and South Stream transit projects).
    - **Non-transparent intermediaries**, and their role in EU gas imports, may further complicate market regulation. This is currently mainly a challenge in Central European countries where the appearance of companies trading Russian or allegedly Caspian gas, and informally or formally connected with Gazprom, substitute other forms of competition on the internal gas market (Gazprom-related gas traders as Emfesz in Hungary and Poland, Vemex in Czech Republic, previously Eural Trans Gas and then RosUkrEnergo in Hungary, Poland and Germany) (see box 5.7 below).

- The political relations between the EU and Russia

Tensions in political EU-Russian relations could eventually have some effect on European energy security.

- Overdependence

Possible growth of EU gas import volumes from (or via) Russia could translate into a higher share of Russian gas in European consumption (although any substantial increase of Russia's share in total gas imports appears unlikely). This raises questions about the possibility of import overdependence, especially if the LNG market is slower to develop. It is worth noting that this risk of overdependence and the risk of insufficient Russian production / exports are mutually exclusive.

[89] See e.g. http://uk.reuters.com/article/oilRpt/idUKL073245820071207.

The other problem is possible Russian / Gazprom control over CIS hydrocarbon exports, which would diminish the Caspian's potential role as an independent, additional source of energy for the EU. This could materialise if Gazprom limited access of Caspian resources to the EU market and slowed or effectively blocked diversification of gas projects for Europe (e.g. South Stream project potentially foreclosing the Nabucco pipeline) or competition on the internal markets of EU member states.

Box 5.7 Energy offshore traders

Since early 2000, several new and non-EU energy traders have progressively entered the EU gas, and also electricity, markets. Energy offshore traders have a representation or headquarters in the EU but their ownership and basis of activities are outside the EU. They often use multiple offshore banks and companies to dissimulate effective company ownership and conditions of business of operations on various EU markets.

Among the examples are gas traders Eural Trans Gas (2003-2004, headquarters in Budapest) and then RosUkrEnergo (since 2005, headquarters in Switzerland), which have been primarily acting as intermediaries between Turkmenistan and Ukraine for the export and transit (via Russia) of huge gas volumes (between 35 and 41 bcm annually) on behalf of Gazprom. Both companies have been indirectly (Eural Trans Gas) or directly (RosUkrEnergo) co-owned and controlled by Gazprom's senior management. Export and trading contracts between Turkmenistan, Gazprom (official buyer of the Turkmen gas), offshore traders and Ukraine have remained opaque. Nonetheless, the traders have been able to re-export gas to EU markets, notably Poland, Hungary, Slovakia (and possibly Germany) at much higher prices than in the CIS but apparently at lower prices than those applied to Gazprom's long-term contracts with these gas companies.

Gas traders Emfesz (apparently linked with Eural Trans Gas, then RosUkrEnergo) in Hungary and Poland, and Vemex in the Czech Republic act as gas traders but their ownership structure and modes of operations, notably the source of gas, are difficult to trace for external observers.

Electricity trader EFT Ltd (Energy Financing Team) with headquarters in London mostly operates in Southeast Europe and in several EU countries (Italy, Greece and Hungary) and Switzerland. Since 2002, EFT has gained a strong position in electricity trading in Southeast Europe, expanding to neighbouring and EU markets and involved in major investment projects. Its ownership structure and operations have remained unclear and its rapid development controversial, as outlined by financial audits from the Office of the High Representative (OHR) in Bosnia and Herzegovina in 2003[90], leading to an investigation by the UK Serious Fraud Office (SFO) in 2005[91].

These offshore traders do not seem to comply with EU corporate governance standards, notably in terms of capital ownership (typically through offshore assets), financial disclosure (collaterals and funding through offshore and/or CIS financial operators) and business operations outside the EU (e.g. gas and electricity

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90 "The London based firm Energy Financing Team (EFT) has been accused of taking advantage of the corrupt situation in Elektroprivreda Republika Srpska and manipulating the tenders for the concession of HPP Buk Bijela and electricity purchasing from ERS. It is being investigated by the UK Serious Fraud Office for alleged corruption, while the Special Department of BiH Prosecution Office is investigating the involvement of several organisations and individuals." Cited from "Arrested Development Energy in the Balkans- Energy Efficiency and Renewable", Bank Watch, May 2005, www.bankwatch.org

91 "It is of great concern to us that the EBRD is considering a loan for Energy Financing Team (EFT), a company which is under continued investigation by the UK Serious Fraud Office (SFO) regarding its activities in Bosnia-Herzegovina." "Letter to the EBRD regarding the procurement notice for the Stanari thermal power plant project" from the Center for Environment (Banja Luka)/Bank Watch, November 16, 2007, http://bankwatch.org/project.shtml?apc=147579--c--1&x=2058627.

purchase under unclear or undisclosed conditions). Their EU operations on a relatively large scale have raised issues of fair competition (EU client gas companies benefit from a lower price in closed deals with intermediaries), market transparency and security of energy supply (e.g. Eural Trans Gas abruptly stopped its operations and gas deliveries to Eastern Europe in 2004 after controversy over its ownership and operations). These traders can also coordinate actions with Gazprom – as was apparently the case in late 2006 during price negotiations between Poland and Gazprom.

For oil, in the 1990s and early 2000s, various Russian oil companies used offshore trading companies (some of which were their subsidiaries) for exports to Europe, in particular Central Europe. Also trading companies based in Central Europe have played a significant role in exports of Russian crude oil and oil products (e.g. J&S Group in Poland traded 23 Mt of oil in 2003, or around 13% of total EU27 oil imports from Russia). They seem to have benefited from privileged access to oil and have allegedly become impossible to circumvent for oil refiners.

5.7 Conclusions

The key conclusions emerging from this chapter can be summarised as follows:

- At current trends, EU energy consumption will increase by around 15% by 2030. In combination with declining domestic oil and gas output this will led to rising energy import dependency to around 70% (over 90% for oil and over 80% for natural gas).
- The CIS region is a major energy producer and exporter and already the largest oil and gas supplier to the EU, covering over one-third of its oil imports and almost 40% of gas imports.
- Russia still accounts for 80% of CIS hydrocarbon output and exports. It exports over half of its crude oil production (258 Mt exports in 2007) and just above 30% of its gas (or 202 bcm in 2006); export projections for 2020 indicate a great uncertainty ranging between 310 to 400 Mt for oil and 185 to 310 bcm for gas.
- The main determinants of future Russian production and exports are economic (investment in upstream and export capacities, domestic market), regulatory (access to upstream and pipelines for independent producers, domestic gas price), policy (energy efficiency) and technical (rate of recovery) issues.
- EU countries are the main outlet for Russian energy exports in volume terms: over 50% for crude oil, one-third for oil products and close to 70% for gas exports, and even higher shares in export revenues; Russia will likely increase its energy exports to Asia to around 30% by 2020 from fields that are too distant to serve EU markets.
- Caspian oil and gas output, exports and revenues have sustained rapid growth, to account for over 20% of CIS energy exports, and play a balancing role in Russian gas supply. However, exports have remained constrained by pipeline capacities, mostly transiting Russia, despite new oil and gas evacuation routes to Turkey (especially the oil BTC pipeline). Kazakhstan and Azerbaijan account for around 5% of EU oil imports, while Turkmenistan does not directly supply gas to EU markets as it has agreed long-term supply contracts with Russia. The future directions of oil and gas export from Kazakhstan and Turkmenistan are still uncertain.
- The purchase and transit of natural gas between EU importers and non-EU suppliers rely on bilateral contracts, while there is no overall regulation applicable except for the Energy Charter Treaty framework.

- The identified risks of CIS energy supply for the EU markets have evolved since 2005 and include a possible slowdown of production and exports because of insufficient domestic investments and an uncontrolled increase in demand; supply disruptions resulting from regional or domestic political and economic crises; and the dominance by a single integrated company over the gas chain with possible abuse in EU transmission and distribution segments.

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6. Strategies and policy options for the energy sector development in the CIS region

6.1 Introduction

As shown and analysed in Chapters 3 and 4, energy sectors play substantial macroeconomic roles in several CIS countries. Sectoral policies have a significant impact on the scale and character of these macroeconomic influences and also on the production and export potential of the region. It is therefore important to understand the energy policies pursued by CIS governments, as well as the actions of the largest energy companies from the region that have become important international players in the European oil and gas markets. This chapter attempts to shed light on the past, present and in particular likely future trends in these policies and strategies. It also tries to suggest ways in which external actors, notably the EU, could support positive changes in the CIS energy markets.

The structure of the chapter is as follows. The next section analyses the main features of the CIS energy sectors in the light of the reforms (covered in section 6.3) that have been initiated in most countries with varying degrees of success and resistance. The electricity, gas and oil sub-sectors are covered in more detail. Section 6.4 focuses on the external energy strategies of CIS governments and major companies. It also covers transit issues in more detail. Section 6.5 presents current EU strategy for energy relations with the CIS region and provides some preliminary recommendations for EU actors as to how they can try to maximise the future reliability and security of energy supply in the context of the EU's internal and external energy policies. The final section concludes.

6.2. Main issues and challenges facing CIS energy sectors – an overview

We start the discussion from an overview of the common features and dynamics of change in the CIS energy sectors since the start of the transition. The analysis mostly covers the domestic energy sector and focuses on key aspects of export orientated activities: oil and gas upstream and midstream. A grouping of CIS countries allows the identifying of some common features, as well as key differences.

Despite some reform progress and achievements, CIS energy sectors remain troubled, with several problems affecting the development of the economies (mainly due to the high macroeconomic importance of the energy sector) and indirectly also the EU, as the key market for CIS energy exports.

Among the key factors that have played a role in determining the dynamics of the transformation in the CIS energy sectors one can list the following. Firstly, a Soviet legacy of well-developed energy infrastructure relative to the level of development of several CIS countries during the 1990s, added to a significant decline in energy demand due to economic contraction and low international oil prices allowing delays in more ambitious reforms during the 1990s and a reliance on quick and temporary solutions. Secondly, the Soviet legacy of public perceptions of provision of electricity, gas and other utilities as an entitlement rather than as a service that needs to be bought at a price reflecting the (potentially varying) costs of production has tended to make tariff increases difficult to implement for political reasons. Thirdly, network utility reforms are difficult to implement even in highly developed countries (as evident from EU problems in this sphere), so the task facing less developed CIS economies is very difficult indeed. Fourthly, political conflicts, lack of a culture of effective international co-operation and in some cases also lack of functioning interconnections imply that potential gains from energy trade and energy co-operation between CIS economies are underutilised, leading to problems in several countries (a good example is provided by inefficient solutions to the regional water-gas-electricity interdependence among Central Asian republics). Finally, from today's perspective, the long period of severe underinvestment in energy infrastructure, combined with a strong economic rebound in the region since 1998-2000 and high energy intensity, have created a situation where an energy supply disturbances may be in the offing, endangering the reliability and quality of services in the medium-term. This has coincided with a major increase in global commodity prices and the ensuing widening of the gap between energy prices in CIS markets and those charged in the EU. This has in turn prompted an upward adjustment of natural gas prices in intra-CIS trade.

Initially, political resistance to reforms, in particular the energy regulatory framework (pricing, investment conditions) and corporate governance (public and private) of public companies, resulted in underinvestment in domestic systems that are structurally old, based on obsolete Soviet-type technology and characterised by low economic and energy efficiency. This results in relatively high costs of energy production (e.g. district heating systems with high generation and distribution losses generate high costs, that are not covered by tariffs) and unreliable supply (electricity and district heating outages/interruptions). This relative inefficiency and high costs translate into a high share of cross-subsidisation and other kinds of quasi fiscal activities (see section 4.5 for an in-depth discussion).

Governments often remain directly involved in the regulation of markets and the activities of the major companies. Actually, the governments still retain and concentrate the functions of policy-making, regulatory preparation and enforcement (with weak and/or little empowered regulators) and ownership control of state-owned companies. At the same time policy-maker, regulator and operator leads to conflict of interests and political interferences in decisions that are often influenced by factors beyond economic rationale. This non-separation of state functions, which proved crucial for effective and durable energy reforms in several European transition economies, has even been reinforced with further control over the energy sector, including indirect re-nationalisation of a large part of the upstream oil sector in Russia since 2003, seriously undermining the exercise of the rule of law and independence of judicial systems. Therefore, these regulatory and economic conditions have largely blocked or limited private sector investment in many energy sectors in several CIS countries. Furthermore, in the energy producing countries, the investment climate is rather unfavourable for private, and in particular foreign, investors.

CIS energy systems are still largely based on deteriorated infrastructure and outdated technology, vertically integrated national monopolies and strong governmental control over and regulation of energy companies.

6.2.1 Russia

The key challenges differ between the various sub-sectors of the Russian energy complex. The gas sector appears to be the least reformed, complicating the production outlook, but there are also changes in other sub-sectors (due to the dominant role of gas in the energy mix). In the oil upstream the full consequences of the wave of re-nationalisation of assets are yet to be seen. The technological backwardness of the refining sectors is a serious issue. The electricity sector is in the midst of an ambitious and very complicated reform process.

The growing costs of production due to obsolete technology, lack of modern extraction techniques and new findings, low efficiency of extraction, transport and use will if not tackled gradually reduce Russia's competitive advantages within the energy sector (Leijonhielm and Larsson, 2004). Chronic underinvestment in productive upstream and transport raises questions as to the capacities of the Russian oil and gas sectors to maintain sufficient production to secure export volumes and reliability (without re-exports of Caspian region production).

6.2.2 Caspian region

The energy systems in the Caspian region have been little reformed and have suffered due to lack of adequate maintenance and investment. All countries badly need investments in their energy sectors and better management to improve reliability and efficiency. However, some governments have been increasing restrictions for foreign investors, which may undermine the effective development of upstream gas and oil production.

Kazakhstan and Azerbaijan have been successful in attracting investments, with foreign companies acquiring a considerable share in the oil and gas upstream. In Kazakhstan, one recent problematic issue has been the changing attitude towards foreign investors, while in view of the substantial dependence on Russian transit routes the key questions relate to transport of the increasing volumes of extracted oil and gas and to the development of new fields.

Investment conditions in both Uzbekistan and Turkmenistan remain very specific and far from international practices and standards. State-owned companies fully control the energy sectors in a context of closed and authoritarian regimes. Nonetheless, in both Uzbekistan and Turkmenistan, foreign companies such as Russian Lukoil and Gazprom, Malaysian Petronas Carigali Overseas, Korean KNOC and Chinese CNPC and CNODC are active, mainly in smaller upstream projects. The position of European investors is significantly weaker. Both countries have been trying to boost activities in the energy sector, with some measures aimed at attracting foreign investors. Success will depend on internal political developments, real progress in energy sector reform (which have not seriously started, yet), and prospects for export routes.

There are also increasing problems with the state of oil and gas pipelines in all CIS countries, in particular in Central Asia (but also in Ukraine, for example). Most infrastructure dates back to the 1960-1970s and since then maintenance and investment have been insufficient[92]. For example, in Kazakhstan depreciation of energy sector infrastructure is estimated by some sources to be around 70%[93]. Ageing infrastructure, above all of the pipelines, could affect the security of CIS energy transit to Europe.

92 See e.g. www.adb.org/Documents/Events/2006/CAREC-BDF/energy-sector-ru.pdf.

93 See e.g. www.un.org/russian/esa/hdr/Central_Asia_2005.pdf; www.kazenergy.com/index.php?option=com_content&task=view&id=463&Itemid=109; www.kaztransgas.kz/article.php?article_id=669.

6.2.3 CIS energy importers

For CIS energy importers (Belarus, Ukraine, Georgia, Armenia, Moldova, Kyrgyzstan and Tajikistan), while there are substantial differences in reform progress and the functioning of the energy sectors, the most typical and important energy problems and weaknesses relevant for several countries include[94]:

- High energy intensity, low efficiency of energy supply and usage, substantial energy losses,
- Ageing physical infrastructure, deterioration of the domestic energy infrastructure,
- Prevailing state-ownership and the limited commercial focus of large parts of the energy sector,
- Weak legislative and regulatory framework, poor investment climate, limited investment possibilities in the sector (e.g. due to energy tariff policy),
- Fiscal pressures resulting from explicit and implicit subsidies related to the energy sector,
- Lack of information for consumers on likely future price increases, depriving energy users of incentives to make the necessary energy efficiency investments,
- Strong dependence on Russia or Uzbekistan for energy (primarily gas) supplies and lack of transparency in contractual and delivery conditions (use of intermediaries), as well as limited trade in electricity and energy commodities between countries, all limiting the room for manoeuvre of domestic policies.

The most important trends, problems, weakness and challenges for the energy sector in Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan are presented in Table 6.1.

Table 6.1 Analysis of current trends, problems and challenges in the energy sector of CIS energy producing countries

Azerbaijan

Weaknesses, problems, alarming trends:

Physical obsolescence of electricity and gas transmission and distribution networks;

The unresolved status of the Caspian Sea (obstacles to exploration in some areas and new cross-border pipelines)

A weak legislative and regulatory framework; rule of law and independence of judiciary questionable

Postponed reforms in the electricity and downstream gas sectors, leading to poor payment discipline and low investment

Low corporate standards (accountancy transparency, financial disclosure, accountability of management and supervisory boards)

Low energy efficiency

Challenges:

Macroeconomic management of the major but probably short-lived oil boom: avoiding Dutch Disease, management of windfall budget revenues, etc., building a base for economic diversification once oil production declines

Dealing with the narrow and short-term interests of certain interest groups within the energy sector

[94] For more details see SWOT analyses in country background notes in Appendix 1.

Reducing energy intensity, modernisation of energy infrastructure, reforms of gas and power sectors

Addressing environmental challenges, reduction of emissions and energy waste

Kazakhstan

Weaknesses, problems, alarming trends:

Physical obsolescence of electricity and gas transmission and distribution networks, and district heating; lack of interconnection between gas production in the north of the country and consumption in the south

Substantial dependence on Russian transit oil pipelines

A relatively unclear and instable legislative and regulatory framework; rule of law and independence of justice questionable

Postponed reforms in the electricity and downstream gas sector, leading to low investment

Low corporate standards (accountancy transparency, financial disclosure, accountability of management and supervisory boards)

Narrow and short-term interests of certain lobby groups within the sector

More difficult environment for foreign investments (and operation of existing projects) in the oil and gas upstream sector

Low energy efficiency

Challenges:

Securing export routes for oil and gas in view of expected doubling of output by 2015

Macroeconomic management of the oil boom: avoiding Dutch Disease, management of windfall budget revenues, etc., building a base for economic diversification

Reducing energy intensity, modernisation of energy infrastructure, reforms of gas and power sectors

Addressing environmental challenges, reduction of emissions and energy waste

Russia

Weaknesses, problems, alarming trends:

High entry barriers to private (domestic and foreign) investment in upstream, problems facing existing projects - state control, interference and protectionism

Politicised use of energy exports and infrastructure (transit, distribution) in relations with East European and CIS countries, deterioration of political relations with the EU and some CIS countries

Physical obsolescence of electricity and gas transmission networks, and district heating

Postponed structural reforms, first of all in the gas sector, leading to low investment

Limited gas storage for peak demand and exports

A weak legislative and regulatory framework; rule of law and independence of justice questionable

Low corporate standards (accountancy transparency, financial disclosure, accountability of management and supervisory boards)

Low energy efficiency of energy sector and use; significant energy and revenue waste of gas flaring

Challenges:

Reforming the gas sector, completion of the electricity sector reform (2011) – in view of strong opposition from interest groups

Ensuring sufficient investments to develop upstream gas resources in line with rising demand

Managing Gazprom and Rosneft in view of their increasingly multi-sectoral and international expansion – limiting the influence of personal vested interested

Development of new gas and oil fields in very difficult geological, geographical and climate conditions

Macroeconomic management of the oil boom: avoiding Dutch Disease, management of windfall budget revenues, etc., building a base for economic diversification

Reducing energy intensity, modernisation of energy infrastructure

Addressing environmental challenges, reduction of emissions and energy waste

Uzbekistan

Weaknesses, problems, alarming trends:

Lack of any serious reforms in the energy sector

Physical obsolescence of electricity and gas transmission networks – electricity black-outs, huge gas losses

Dominance of state-owned companies

A weak legislative and regulatory framework; rule of law and independence of justice questionable

Postponed/blocked reforms in the electricity and downstream gas sector, leading to poor payment discipline and low investment

Lack of domestic investment resources and know-how technologies for new fields extraction, lack of openness to foreign capital

Low energy efficiency

Challenges:

Reforming the gas and electricity sectors, ensuing more efficient co-operation with other Caspian countries in the gas-power-water sphere

Maintenance of energy infrastructure, reducing gas waste

Reducing energy intensity, modernisation of energy infrastructure

Turkmenistan

Weaknesses, problems, alarming trends:

Lack of any serious reforms in the energy sector

Physical obsolescence of electricity and gas transmission networks

Dominance of state-owned companies

Dependence on Russian gas transit monopoly

The unresolved status of the Caspian Sea (obstacle to exploration and new cross-border pipelines)

A weak legislative and regulatory framework

Postponed/blocked reforms in the electricity and downstream gas sector, leading to poor payment discipline and low investment

Lack of domestic investment resources and know-how technologies for new fields extraction

Low energy efficiency

Challenges:

Attracting foreign capital after years of isolation

Macroeconomic management: avoiding Dutch Disease, management of windfall budget revenues, etc., building a base for economic diversification

Maintenance of energy infrastructure, reducing gas waste

Reducing energy intensity, modernisation of energy infrastructure

Diversification of export routes
Completing geological survey on gas/oil deposits

Source: Own elaboration.

6.3 CIS domestic energy reforms

This section covers in more detail energy policy features and the status of reform across the CIS. It aims to identify and analyse the main issues in the key CIS countries, followed by a more detailed analysis by sub-sector (electricity, gas and oil as well as energy efficiency).

6.3.1 Energy Strategies

Only a few CIS countries (notably Russia and Ukraine) have developed and adopted comprehensive energy strategies (or policies) that generally assess and analyse the existing energy situation, trends (demand, technology, exports), issues/challenges and options in order to set the energy priorities for the medium- to long-term.

In **Russia**, the first energy strategy was adopted in 1996. Its main priority was to further develop natural gas and oil production. However, the quantitative objectives were not fulfilled, prompting the Ministry of Energy to develop a new document "Basic Guidelines for the Energy Strategy to 2020", which was approved in 2000. At this time, total investment needs for the energy sector by 2020 were estimated at USD 550-700 billion. In 2002, the government launched a new and broader process involving various institutions co-ordinated by the Ministry of Energy that produced the *Energy Strategy of Russia to 2020* (Government of Russia, 2003), which was approved in 2003 and is still in force[95]. Its stated priorities include:

- Ensuring sufficient and reliable energy supply to the population and the economy,
- Reducing energy production costs thanks to more rational use of resources and energy-efficient technologies,
- Enhancing financial stability and efficiency of the energy sector,
- Reducing the impacts of energy production and use on the environment.

One of the main strategic issues of this document is energy safety. In order to achieve this goal, Russia has developed an external energy policy (see section 6.4), which is designed to provide assistance to Russian energy companies in strengthening their role in the domestic and international energy markets.

An important element of the policy is also the attitude towards foreign investments in the sector. Here, early 2008 brought some new developments (Box 6.1).

Box 6.1 New regulations for FDI in the Russian energy sector

On April 2, 2008, the Russian Parliament approved the Law "On Foreign Investment in Strategic Sectors". The Law regulates and restricts foreign investments in 42 sectors labelled "strategic", including the manufacture and sale of military hardware, the nuclear industry, aero and space industries, biotechnology, mass media, the exploration and extraction of mineral resources, etc.

[95] The publication of a new strategy is expected in 2008 or 2009.

As a result, private investors will need approval from a governmental commission if they want to acquire more than a 50% stake in a company that is active in any of the designated sectors. The 25% threshold will apply to foreign state-controlled companies. Foreign companies that have a history of investments in the Russian economy should inform the Russian government about their shares in strategic companies when these exceed 5% and also get approval. Also, foreign investors that participate in large projects related to mineral resources or oil and gas will not have the right to own more than a 10% stake unless they receive governmental approval. The strategic reserve is defined as consisting of more than 70 Mt tons of oil or more than 50 bcm of gas.

Among the positive aspects of the new Law, one may say that the ‘rules of the game’ are now clear. On the other hand, many lawyers admit that it leaves many questions unanswered, allowing the governmental commission to decide on most issues in a discretionary way. Besides, it is very likely that the law will result in additional bureaucratic barriers. According to the Law, following all the needed procedures and approvals for investments (including from the Federal Security Service, the FSB) would take up to 6 months. However, the law does not contain a clear indication that the authorities must provide an answer within 6 months. Also, investors in the strategic sectors and enterprise should be prepared for additional inspections, controls and possibly interferences. Investors in the energy sector used to complain they had to negotiate with Gazprom and Rosneft, the two largest energy companies, to be able to participate in large investment projects in the Russian energy sector. Now they are afraid that the deals they managed to agree on with these companies will be affected by new restrictions from the government, which would require seeking new approval for all these plans.

Therefore, the new law is perceived as restricting foreign investments in the Russian economy, first of all in the energy sector. The new law slows the decision making process and introduces more bureaucratic hassle and subjective factors. This cannot be expected to enhance the competitiveness of the Russian economy, but rather to hand control over strategic sectors to a narrow group of high level officials.

In other CIS countries, progress in adoption of explicit policy documents (energy strategy) has been uneven. Energy exporting countries in the Caspian region have not developed explicit energy strategies, largely reflecting the centralised and autocratic management of the sector, which is mainly export-oriented.

Ukraine adopted its first energy strategy in 1996 and in 2006 came out with a comprehensive document, *Ukraine’s Energy Strategy to 2030* (Government of Ukraine, 2006). Its key priorities are to enhance Ukraine’s energy security, improve its position on international energy markets, reduce the energy intensity of the economy and integrate with the EU energy system (IEA, 2006). The strategy was launched in the first quarter of 2006, i.e. after the gas price increases and was thus aimed, inter alia, at counterbalancing the possible effects of the new price environment[96]. The document also foresees import diversification by engaging in projects that would create alternatives to supplies from Russia (e.g. Odessa-Brody-Plock-Gdansk pipeline, idea of gas pipeline from Iran, etc).

In 2007, **Belarus** adopted an energy strategy up to 2011 seeking to modernise the energy system, realise energy savings and raise the share of locally available energy resources. The document is designed to boost energy security, understood as lower reliance on imported resources. It thus foresees a reduction in energy consumption (by one third) and increasing use of domestic energy resources. Other measures included diversification of oil supply and an increase in subsidies to refineries. Other priorities include modernisation of energy facilities (with envisaged investment of USD 19 billion), energy-saving measures (USD 9 billion) and further use of unconventional

[96] See http://www.kmu.gov.ua/control/en/publish/article?art_id=30526441&cat_id=2291893.

and renewable energy resources. However, to date it remains unclear whence such financial resources will be available. The government plans to use budget resources and take loans to support own sources of energy companies. Additionally, the government has announced a decision to build a nuclear power station by 2018.

In mid-2007, **Moldova** adopted an Energy Strategy to 2020, with the stated aims of ensuring energy security, raising efficiency of the energy sector, enhancing the use of renewable energy sources, energy market liberalisation and restructuring of the energy complex. The goal of EU integration appears to be the main driving force behind the development of this strategy. In particular it was probably related to the process of integration in the Energy Community (where Moldova has an observer status). The strategy assumes closer energy co-operation with neighbouring countries (Ukraine and Romania) and joining the Union for Coordination of Transmission of Electricity (UCTE), the association of transmission system operators in continental Europe.

6.3.2 Electricity sector

One feature of the Soviet period in the CIS region was a relatively high level of electrification and well functioning power supply compared to other countries at similar levels of development. The break-up of the Soviet Union complicated the situation in the power sector in several respects, but developed power distribution capacity and transmission infrastructure can be still considered strengths, at least in some countries.

The dissolution of the Soviet Union resulted in a partition of electricity networks, difficult political relations between some countries and economic instability. As a result, electricity trade became very difficult between countries and regions with abundant electricity generation capacities and countries and regions with supply shortages. Also, intra-CIS trade in energy commodities was affected and as a result it was, for example, difficult in some areas to find gas for power plants that were built to operate only on gas. A major decline in economic activity and macroeconomic instability added to the problems. All this led to a significant decline in electricity production (for example, between 1992 and 2000 in Armenia and Georgia, primary energy supplies plummeted by more than 85% - IEA, 2000) and despite a sizeable decline in power demand, in particular from industry, in many countries (particularly in Armenia, Georgia, Azerbaijan, Kyrgyzstan and Tajikistan) power shortages became common because of the extensive use of electricity for household heating.

The varying progress in reforms in the electricity sectors since then has been determined by several factors, including the condition of the inherited infrastructure, availability and costs of inputs for power generation, trends in electricity demand, etc. Table 6.2 presents a synthetic overview of the situation of the sector in CIS countries. Overall, it is worth noting that some countries have achieved substantial progress in reforms and have a clear agenda for further changes. In other countries, the situation appears less promising.

The key objectives in electricity sector reforms in the CIS are centred on building or strengthening market mechanisms, enforcing competition and increasing efficiency of operations. They are also aimed at attracting the investments necessary to sustain, modernise and – where needed – expand infrastructure (EBRD, 1999; IEA, 2002). The standard approach to reforms in electricity sector have involved the following elements (implemented with varying degrees of success):

- restructuring and vertical and horizontal unbundling (generation, transmission and distribution);

- establishment of an independent regulator;
- increase of electricity tariffs to cost-recovery levels and eliminating cross-subsidisation due to economically unjustified differences in prices for various consumers
- introduction of a wholesale spot market;
- privatisation, entry of independent power producers and / or distribution companies.

Evaluation of electricity reforms in various countries is complicated by the diversity of domestic conditions and lack of independent and accurate assessments. One valuable source is the EBRD (2007) transition indicators for power sector reform[97], albeit clearly entailing substantial simplifications, and in particular possibly somewhat biased towards de jure rules rather than operational practices. Applying these indicators as a measure of progress would allow a classification of CIS countries into three groups:

- 'advanced reformers' – Armenia, Georgia, Kazakhstan, Moldova, Russia and Ukraine. The average score of this group in 2007 is 3.22;
- 'intermediate reformers' – Azerbaijan, Kyrgyzstan, Uzbekistan. The average score is 2.33;
- 'outsiders' – Belarus, Turkmenistan, and Tajikistan, with an average score of 1.33 (there is clearly an important difference between Tajikistan scoring 2 and Belarus and Turkmenistan evaluated at 1).

The first two groups started reforms of their electricity sectors around 1995-1996. Since then the first group has progressed substantially, while the second has postponed or delayed many of the necessary changes. The level of reforms in the first group can be compared to East European transition countries (EBRD, 2007). The third group of countries has not yet started any more meaningful reforms.

In most CIS countries, the establishment of an independent regulator (except Belarus, Tajikistan, Turkmenistan and Uzbekistan) and unbundling and partial privatisation (first of all of generating capacities) have been implemented with relatively low resistance. In contrast, more challenging issues such as tariff reform, restructuring of vertically integrated monopolies, privatisation of distribution networks and third-party access to the networks have required much more political will and efforts and have been a mixed success so far. Pricing policy has proven to be particularly difficult to disentangle from social policies (and thus also political from fights), and, for example

[97] EBRD indicators range from 1 to 4+ (4.33), with 1 representing the standards of a planned economy and 4.33 those of a well-functioning market economy. In the case of electric power, the EBRD provides the following classification: (1) Power sector operates as a government department with few commercial freedoms or pressures. Average prices well below costs, with extensive cross-subsidies. Monolithic structure, with no separation of different parts of the business; (2) Power company distanced from government, but there is still political interference. Some attempt to harden budget constraints, but effective tariffs are low. Weak management incentives for efficient performance. Little institutional reform and minimal, if any, private sector involvement; (3) Law passed providing for full-scale restructuring of industry, including vertical unbundling through account separation and the setting up of a regulator. Some tariff reform and improvements in revenue collection. Some private sector involvement; (4) Separation of generation, transmission and distribution. Independent regulator set up. Rules for cost-reflective tariff-setting formulated and implemented. Substantial private sector involvement in distribution and/or generation. Some degree of liberalisation; (4+) Tariffs cost-reflective and provide adequate incentives for efficiency improvements. Large-scale private sector involvement in the unbundled and well-regulated sector. Fully liberalised sector with well-functioning arrangements for network access and full competition in generation.

to date all countries have put privileged tariffs in place for selected customers (households, industrial, agricultural) due to political considerations. In this sphere, there is probably still a gap between advanced CIS reformers and the new EU member states. Besides, restructuring and unbundling, which to high degree define 'reform success', are clearly not enough in themselves to ensure efficient performance of the sector. The introduction of a wholesale market under conditions of state dominance in the sector, lack of competition and rigid tariff policy have turned out not to produce the expected outcomes[98]. Indeed, one important lesson from the experience of several CIS countries is that proper timing and sequencing of reform stages matters.

All countries are faced with the problem of deteriorating physical power infrastructure and need substantial investments to replace ageing equipment to limit power shortages that may occur in the coming years in the face of increasing peak demand (e.g. in countries such as Tajikistan, Kyrgyzstan, Kazakhstan and Russia). In order to make investment decisions, companies need to see profit opportunities in the longer run, which in particular requires that tariff policy ensures recovery of costs and is predictable over the long-term. The quasi fiscal roles of the energy sector, where non-payment, too low tariffs and other mechanisms discussed in detail in section 4.6 of this report can undermine the financial position of power sector companies, deterring investments.

Despite an unclear and unfavourable investment framework, domestic and foreign investors in the power sector are apparent in several countries. Tajikistan recently attracted around USD 1 billion in Chinese loans for new/existing hydropower generation projects. Russia's RAO UES has acquired significant assets in some CIS energy sectors, as detailed in the section below. The privatisation of some Russian wholesale generation companies attracted around USD 15 billion in 2007, including large foreign players such as E.ON and ENEL, which acquired 25% stakes in two large power generation companies, OGK 4 and OGK 5. Such high interest in Russian electricity generation came as a surprise, given the constrained electricity tariffs, escalating fuel costs and government support for nuclear generation (Pogrebnyak, 2007). In Kyrgyzstan, the government announced an ambitious privatisation plan for the electricity sector in 2007.

While privatisations may be beneficial in terms of enhancing the effectiveness of the power sector, they require a regulatory framework to avoid a situation where privatised companies acquire a monopolistic position. In the case of investments from other CIS countries an additional risk some experts have alluded to is related to the potential use of strong market position to foster non-economic, political objectives. Such voices have been raised e.g. in the case of several foreign acquisitions by RAO UES, but also e.g. in relation to Kazakhstani investors' interest in the Kambarata 2 hydropower in Kyrgyzstan. Its importance is related to its location on the Syr-daria river, which plays a key role in the regional water system. It is difficult to judge the extent to which these concerns are justified, and each case would need to be analysed separately. A strong regulatory regime with efficient implementation can help in overcoming potential problems.

Box. 6.2 Electricity reform in Russia

Russian electricity sector reform aimed at de-monopolisation of the sector and development of competition in the electricity market. (Key documents are the governmental resolution #526 from 2001 and "Concept of the UES's Strategy for 2005-2008 "5+5"). In April 2007, and then in early May 2008 the government set out its objective to launch a final market model in 2011.

[98] For example, in Ukraine a wholesale electricity market merely serves a single state-owned company buying electricity from various companies but at regulated prices.

A major achievement of the reform has been to separate natural monopolies (electricity transmission, distribution, dispatcher and operation management, repair and service companies) from potentially competitive functions (generation and sales of electricity).

To replace the vertically-integrated companies, new separate structures were created, which specialise in specific functions. For instance, the national transmission grid is now under the majority ownership and control of the Federal Network System (FSK), a 75%-subsidiary of UES (25% of FSK is owned by the Federal Agency for Property Management with the goal of increasing this to 75%); distribution networks are integrated in interregional distribution network companies (MRSK); regional dispatching is under the responsibility of the national System Operator. The electricity generation assets have been grouped in inter-regional companies of two kinds: generating companies in the wholesale market (OGK) and territorial generating companies (TGK). OGKs (6 companies based on thermal power plants and one on hydropower) regroup power plants according to extraterritorial principles, while TGKs regroup heat and co-generation plants on a territorial basis.

The process of corporatisation of the various entities (JSC “AO-energo”) started in 2003. In 2004, the first regional company JSC “KalugaEnergo” was reorganised and by the end of the year the first three OGKs, two TGKs and four MRSKs were created. In 2004, the new vertical dispatcher management was transferred to the System Operator. By the end of 2005 the majority of companies had been reformed. In 2007, the process of reforming all 71 AO-energo, formation and reorganisation of all OGKs and most TGKs, as well as the creation of network companies, was almost finalised. By mid-2008 RAO UES (52% directly owned by the state, 14% by Gazprombank, 14% by ING Bank and 20% by others) should be reorganised. It is foreseen that generation and sales companies will be private (already 25% of two large OGKs- OGK 4 and OGK 5- were sold to E.ON and ENEL in 2007) and start competing with each other. In 2006, spot market – day ahead market (DAM) was introduced.

After six years of reform and despite formal progress in restructuring the sector, the process has not yet met its main objectives. At first, a competitive market is not yet effective and administrative tariffs have not been replaced by free (or market) tariff setting, now foreseen for 2011. Also, the state has been increasing its presence and control, notably in generation. Gazprom took control of a third of Russia's wholesale electricity generation capacity, including Moscow-based OGK-6 (47% purchased in 2007) and OGK-2. The current reform agenda focuses on secondary issues, such as a new model of regulated market, but ownership of natural monopolies has not yet been separated from commercial operations.

The national election campaigns of 2004 and 2007-2008 postponed decisions on reforms in the electricity sector. Moreover, the objective for market liberalisation has been postponed several times. The current reform plan has some contradictions, as privatisation alternates with nationalisation, and increasing control on tariff setting with liberalisation.

The Russian electricity sector does need significant investments, in particular in maintenance and improvement of existing facilities. Centralised funding will not be sufficient to cover these needs. Some private investors are buying shares of existing energy companies, but are not willing to invest in modernisation and new capacities due to the high regulatory risks and low profitability.

Sources: www.rao-ees.ru, www.expert.ru, www.energypolicy.ru, other Russian internet sources.

Many CIS countries have tried to introduce modern regulatory and legal frameworks for energy sector operations, first of all in the electricity sector. Energy laws in these countries include provisions for the establishment of independent regulatory bodies and specific legislation for operations in the sector. Often, the regulatory commissions have been initially assisted by US technical assistance and have benefited from the network activities of the Energy Regulator

Regional Association (ERRA)[99]. The implementation faces substantial problems in many countries, which should not be particularly surprising given the high degree of competence that is required to draft and implement regulations in such spheres and the generally low governance effectiveness in CIS countries (see section 4.2.5 for discussion). In practice, even when regulatory institutions are established they lack real independence (e.g. on electricity tariffs) and are subject to political influences.

Table 6.2 provides a snapshot on the development and main feature of the electricity reforms in the region.

Table 6.2 Electricity sector reforming

Country	**Regulatory and legal reform (Independent regulator)**	**State ownership and privatisation**		**Structure of the sector**	**Investment climate (foreign investors participation)**	**State presence and political interference (in decision making, top-managers appointments, etc.)**	**Cross subsidisation (tariff subsidies) and quasi fiscal activities [100]**
		Ownership of generation capacities	Ownership of transmission and distribution				
Armenia	Partial	Ownership transferred to foreign (Russian) stateowned investors	Private, 100% belong to Interenergo - a subsidiary of Russian RAO UES	Unbundled	Favourable (Russia, Iran)	No	Almost eliminated
Azerbaijan	No	State, Azerenergy	State, Azerenergy	National vertically integrated monopoly	No FDI in the sector	Strong	Yes, but slightly fell down
Belarus	No	100% state, Belenergo	100% state, Belenergo	National vertically integrated monopoly	No FDI in the sector	Strong, top-managers are appointed only after presidential approval	Yes, but not high
Georgia	Partial	Private, mainly Russian national investors	Transmission is state, distribution – private, mainly Russian investors	Unbundled	Favourable, (Russia, Czech Republic)	No	Yes, but considerably reduced
Moldova	Partial	Private, including foreign (and Russian national) investors	Private, including foreign (and Russian) investors	Unbundled	Favourable (Russia, Spain)	Slight	Yes, limited

[99] The regional network groups 23 regulators in CEEC and CIS; Secretariat based in Budapest; www.erranet.org

[100] For more information see section 4.5

Kazakhstan	Partial	Private, including foreign (Russian) investors	Partly private	Unbundled	Favourable, Russia	Yes	Yes, but slightly fell down
Kyrgyzstan	Partial	Mainly state	National Electrical Grid of Kyrgyzstan (transmission) and distribution companies are mainly state	Unbundled	No FDI in the sector	Yes	Yes, but slightly fell down
Russia	Partial	Partly private, under control of JSC UES (52% belong to Russian state)	Partly state or under control of JSC UES (52% belong to state)	In the process of unbundling	Rather unfavourable (Italy, Germany)	Yes	Yes, but slightly fell down
Tajikistan	No	Under state owned JSC Barqi Tojik	Under state owned JSC Barqi Tojik	National vertically integrated monopoly	No FDI in the sector	Yes	Remain high
Turkmenistan	No	State	State	National vertically integrated monopoly	No FDI in the sector	Yes	Remain high
Ukraine	Partial	Mainly state (90%), Ukrenergo	Transmission is 100% state; distribution is 60% state (as part of JSC Ukrenergo	Unbundled	Minor	Yes	Yes, but not high
Uzbekistan	No	State JSC Uzbekenergo	State JSC Uzbekenergo	National vertically integrated monopoly	No FDI in the sector	Yes	Remain high

Note: The following convention is applied in describing the independence of a regulator. “Independent” implies independence in administrative and financial aspects, at the level of senior management and in current business; “partial” implies that there is some degree of independence.

Sources: EBRD (2007), various IMF and World Bank reports.

6.3.3 The natural gas sector

The gas sector remains the least reformed even in those CIS countries that have achieved substantial progress in other market reforms. Lack of structural and regulatory reforms is typical for all three groups of countries – producers, importers and transit countries (Table 6.3). Among the main peculiarities of gas sector reform are the following:

- presence of a state-owned (or semi-state[101]) vertically integrated monopoly combining commercial and regulatory functions and maintaining tight control over the sector’s infrastructure,
- bundling of transit activities with distribution to final consumers,

[101] In some countries (including Russia, Belarus, Uzbekistan, and Ukraine) gas companies are formally stock companies, but most or all shares belong to the state.

- regulated prices that are below full cost-recovery levels[102], cross subsidisation and state interference in tariff policy,
- limited private sector participation,
- limited access to the network (transmission and transit) for third parties,
- lack of transparency in decision-making and in the sector's overall activity,
- under-financing and lack of investments.

One of the main problems is the occurrence of end-use gas tariffs below costs. Since 2006-2007, many countries (Ukraine, Belarus, Moldova, Kyrgyzstan, and others) have started to increase tariffs. However, the situation with regard to gas producers (Azerbaijan, Kazakhstan, Russia) is worse (see section 4.5). The Russian government in 2006 doubled prices for industrial consumers and in January 2008 residential tariffs increased by 25%, but tariffs are still below real costs and below export prices. The same is relevant for other gas producing countries. Moves to finalise price reform (increasing consumers tariffs to cost recovery level, and higher) have been slower than scheduled and postponed due to the 2007/2008 election campaigns (see section 4.5).

Ageing equipment, network losses, rising costs and inefficiency, poor corporate governance, corruption and lack of transparency reduce actual and potential investments and threaten not only the gas sector but also the countries' development (through electricity and heat generation, incidents, etc.).

For example, in Russia, where the gas sector extremely important in various dimensions (economic, geopolitical, etc), Gazprom's current position within the sector constitutes a significant impediment to the development of small independent gas producers. This happens through a combination of restrictions on small producers' access to the market and making it impossible even for the largest consumers to choose suppliers[103]. Lack of options to sell gas does nothing to reduce massive gas flaring by oil producers (IEA, 2007b). Associated gas is generally flared at oil fields, with economic and environmental consequences. According to the Natural Resources Ministry, out of 55 bcm of associated gas annually extracted, only 26% is actually processed[104]. The related economic losses are estimated at USD 13 billion. 2007 witnessed some policy initiatives aimed at reducing gas flaring, but the implementation of these measures may take some time[105]. The stagnation of Gazprom's production and growing internal and external demand for gas may gradually change the attitude of both Gazprom's management and the government, and ensure better conditions for the operations of independent producers.

[102] Although calculating fair cost-reflective gas prices in producing countries is not easy, there is general agreement that regulated natural gas tariffs are still below full cost recovery levels (first of all for households). See Section 4.5 for discussion.

[103] See www.oecd.org/dataoecd/56/4/32389306.pdf; www.gasandoil.com/goc/marketintelligence/rpi/russian-independent.htm; www.fas.org/sgp/crs/row/RL33212.pdf.

[104] See www.expert.ru/news/2007/10/01/minprirodi/, www.rg.ru/2007/10/02/gaz.html, http://gasforum.ru/novosti/613/, http://www.neftegaz.ru/english/lenta/show.php?id=72273.

[105] In August 2007, the head of Russia's Federal Tariff Service said that the government might ease restrictions on prices for associated natural gas and liberalise the country's associated petroleum gas market by the end of 2007. Russia's Natural Resources Ministry had also called for a plan to use flared gas.

Table 6.3 provides a snapshot of the reform status in the CIS gas sectors, with a focus on regulation, notably pricing.

Table 6.3 Gas sector reforms

Countries	Regulatory and legal reform; Independent regulator	State ownership and privatisation			Cross subsidisation (tariff subsidies) and quasi fiscal activities	State presence and political interference
		Production capacities	Transportation	Distribution		
Armenia	Partial	-	Private/FDI (Russian state-owned company), Armrosgazprom		Almost eliminated	No
Azerbaijan	No	State	Azerigas JSC, 100% state		Yes, but slightly fell down	Yes
Belarus	No	-	National vertically integrated monopoly concern Beltopgas, 100% state-owned		Yes but not high	Yes
Georgia	Partial	-	Partly private	Yes, but considerably reduced	Yes	No
Moldova	Partial	-	Moldovagaz JSC (Gazprom - 50% and Moldovan state - 35%)		Remain slight	Slight
Kazakhstan	Partial	JSC KazMunaiGaz and private companies	National vertically integrated monopoly JSC KazMunaiGaz		Yes, but slightly fell down	Yes
Kyrgyzstan	Partial	-	National vertically integrated monopoly Kyrgyzgas (82% state-owned		Yes, but slightly fell down	Yes
Russia	Partial	Gazprom (>50% state-owned) other producers (16% of market) – mixed ownership	Gazprom		Yes, but slightly fell down	Yes
Tajikistan	No	-	National vertically integrated monopoly Tajikgaz		Remain high	Yes
Turkmenistan	No	Turkmengaz and private companies (less then 10% of market)	National vertically integrated monopoly Turkmenneftgaz		Remain high	Yes
Ukraine	Partial	Ukrgazdobycha (part of Naftogaz Ukrainy), mostly state-owned	Naftogaz Ukrainy	50% private	Yes, but slightly fell down	Yes
Uzbekistan	No	National holding company Uzbekneftgaz, state-owned	JSC Uztransgaz, 100% state-owned		Remain high	Yes

Note: The following convention is applied in describing the independence of a regulator. “Independent” implies independence in administrative and financial aspects, at the level of senior management and in current business; "partial" implies that there is some degree of independence.

Source: EBRD (2007), IMF country reports, World Bank (2006), country background notes (see Appendix 1).

6.3.4 Oil sector

Upstream

Oil extraction is characterised by a significant state presence and control. In some countries (Russia, Kazakhstan and Azerbaijan), there is a trend toward increasing the share of state companies and state presence within the sector. The status and features of reforms within the sector among CIS oil producers are given in Table 6.4.

In the 1990's, the Russian oil sector was characterised by takeovers by new private companies (in opaque conditions) of the dismantled Soviet structures. Since 2003 the trend has been toward increasing the influence and control of the state and state-owned companies in the sector, especially upstream (see box 6.3 below) and transport. For example, if a few years ago the share of state companies in oil extraction in Russia amounted to only 15% (and some expected its further decrease due to plans for Rosneft's privatisation), by 2007 the share of state companies was around 35%, with expectations of a further increase to 50-60% in the next few years.

Box 6.3 Oil sector re-nationalisation in Russia

Yukos Oil Company used to be one of the largest Russian oil companies, accounting for around 20% of Russian oil output or about 2% of world oil production. The company was built by acquiring assets during the opaquely organised privatisations in the second half of the 1990s. In April 2003, Yukos agreed to a merger with Sibneft (another private oil company), but the merger was soon undone in the aftermath of the arrest of Yukos's CEO in October 2003. In August 2006, a Russian court declared Yukos bankrupt. Its assets were sold in several public auctions and the major winner of these was the state-owned company Rosneft, which had previously played a more limited role in the Russian oil business. After acquiring a majority stake in Yukos's main oil producing subsidiary, Rosneft became the third biggest Russian oil company in 2006, and by 2007 became number one in the Russian oil sector, producing more than 100 Mt of crude. Wood Mackenzie, an energy sector consultancy, placed Rosneft in 9th spot in the global ranking of oil and gas reserves (just ahead of BP) as of January 2008, and number 2 in the world ranking of projected total production growth between 2006 and 2011 (Wood Mackenzie, 2008). The Head of Rosneft's Board of Directors, Igor Sechin, also serves as the Head of Kremlin Administration.

In 2005, Gazprom acquired 72% of Sibneft shares. It also created an oil subsidiary, Gazpromneft, which has been active in the Balkan region (Bourgas-Alexandroupolis oil pipeline project, agreement on acquisition of Serbian oil company NIS).

In the oil transport segment, Transneft (a state-owned company) operates one of the largest networks of oil pipelines in the world, controlling about 93% of all oil transported in Russia.

Analysing the trends in ownership changes and activity of Russian companies in CIS take-overs, one can stress another tendency – growing intentions (and moves) to revise the pattern of relations between international energy companies and national energy producers.

All CIS energy producers to a larger or lesser extent are dissatisfied with PSA contracts signed in the 1990s with foreign investors, when CIS countries badly needed investment and technology and energy prices were low. Many of these contracts were signed on terms that were beneficial in the main to the foreign partners, especially after the increase in global oil prices. As discussed in Section 4.2, this prompted a change in policies toward PSAs.

For example, Kazakhstani authorities were not satisfied with the PSA conditions for the giant Kashagan field exploration developed by the Agip KCO consortium led by Eni (Eni, Total, ExxonMobil, Shell, ConocoPhillips, KazMunaiGaz and Inpex). Besides, the government was dissatisfied with delays in the commercial start of exploration from 2008 to the second half of 2010 and the considerable increase in costs (from USD 57 to 136 billion). Kazakhstan insisted on increasing the share of KazMunaiGaz in the consortium and the share in profits from 10% to 40%, acquiring operator status and repayment of ecological compensation to the state budget. Negotiations with foreign investors started in August 2007 and the sides came to a compromise solution only in January 2008, having met most of Kazakhstani demands. In particular, the consortium agreed to pay Kazakhstan compensation of USD 2.5-4.5 billion (depending on oil prices) for the delayed start of the project and double KazMunaiGaz's stake to 16.8%, equalling the holdings of the largest western members of the consortium, also implying a bigger role in running the project. The compromise could also turn out to be the start of the renegotiation of other large oil contracts signed in the 1990s[106].

Table 6.4 Oil upstream sector reforming

Country	Independent regulator	Leading stat-owned companies	State presence and political interference	Foreign investors' participation, Investment climate
Azerbaijan	No	State Oil Company SOCAR	Yes	BP and other foreign oil companies (StatoilHydro, ExxonMobil, Total, LUKOIL, Itochu and others) are contractors in PSAs. Favourable
Kazakhstan	Partial	KazMunaiGaz	Yes	Favourable, but deteriorating: PSAs conditions are being reconsidered
Russia	Partial	Rosneft, Gazpomneft	Yes	BP, ExxonMobil and other foreign investors Rather unfavourable
Turkmenistan	No	Turkmenneftgaz	Yes	Unfavourable / uncertain
Uzbekistan	No	Uzbekneftegaz,	Yes	Unfavourable. However, Uzbek government is offering PSAs for over 80 oil fields

Note: The following convention is applied in describing the independence of a regulator. "Independent" implies independence in administrative and financial aspects, at the level of senior management and in current business; "partial" implies that there is some degree of independence.

Sources: different internet sites, country background notes.

[106] See http://silkroadintelligencer.com/tag/kashagan/, www.crudeaccountability.org/en/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=4&cntnt01returnid=146, http://www.kommersant.ru/doc.aspx?DocsID=797202.

Apart from renegotiations of some PSA agreements (Kashagan in Kazakhstan, Sakhalin 2 in Russia), this type of contract will likely not play a role in future oil and gas exploration deals. In February 2008, the Kazakhstani prime minister announced that the country would no longer sign PSAs[107].

In Azerbaijan, the role of foreign contractors in PSA agreements may gradually decrease as extraction at ACG and Shah Deniz falls, if no new oil and gas reserves are discovered and the government decides to rely less on foreign capital to develop these reserves. The latter appears possible given the stream of revenues accruing to the state from the currently operating projects.

In Russia, recent years have seen a visible change of the investment climate in oil and gas exploration. Foreign investors in all (and only) three PSA experienced pressure from Russian state administrations (on taxation and ecology issues), which resulted in Sakhalin 2 incorporating Gazprom into the project (which is now the lead operator and holds 50%+1). Also, Gazprom may take over all gas production from Sakhalin 1. The Russian gas monopoly obtained similar results with the Kovykta gas field – where it took over TNK-BP's majority stake. The difficult investment environment did not result though in a decrease in the attractiveness of the Russian energy sector. On the contrary, in recent years foreign investments inflow into this sector have seen constant growth. New investments (e.g. Yuzhnorusskoye, Shtokman) are made according to new 'rules of the game': the foreign investor acquires a minority stake, with no right to export by itself when it comes to gas (Łoskot-Strachota and Pełczyńska-Nałęcz, 2008).

Table 6.4 describes the policy and regulatory features in oil upstream sectors.

Downstream

Most refineries in CIS countries have been privatised, but state ownership also plays a role, e.g. in Belarus, Uzbekistan and Turkmenistan.

Domestic oil product prices vary from country to country and are often administratively controlled and generally below EU levels, although fuel quality is also significantly lower. Gasoline prices are subsidised in Russia, Belarus, Azerbaijan, Kazakhstan, Uzbekistan and some other countries. Besides, CIS governments subsidise fuels for agricultural producers.

6.3.5 Energy efficiency

As discussed in section 3.5.2, energy intensities across the CIS economies are high compared to the EU. This is due to highly inefficient energy production, transport and use of energy, also generating heavy pollution. For instance, electricity generation and network (transmission and distribution) losses are high in most systems. Network losses of the CIS networks account for almost 18% of total electricity consumption (IEA, 2007c), 10 percentage points higher than the OECD Europe average. Bringing down the level of network losses to the world average (10%) would save almost 100 TWh in the CIS, or the equivalent of the combined annual electricity consumption of Kazakhstan and Uzbekistan. Losses in the gas system are also significant (see below).

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[107] See 'Kazakhstan to stop concluding production sharing agreements', Eastweeek, no. 117, Centre for Eastern Studies, www.osw.waw.pl.

The potential for improving energy efficiency and reducing energy waste are very high in the energy sector and end-use sectors of producing and importing countries. They would provide energy companies with additional energy resources for exports and increase the competitiveness of businesses, in particular in case of energy-intensive industries. Energy efficiency improvements would bring multiple benefits in terms of energy security and stability of supply, reduced energy investment needs, increase competitiveness and lower pollution and carbon emissions.

Price signals are the potentially most efficient stimuli for energy companies' and customers' behaviour. Thus, a pre-requisite is that regulated electricity, gas and heat tariffs reach cost-reflective levels to develop awareness and make energy efficiency investments viable, starting with basic insulation of buildings. Beyond this, carefully designed public policies on energy efficiency are needed to assist energy companies and customers. Those policies should combine regulatory, fiscal and financial tools, affect several sectors (construction, transport, etc…) and be developed and implemented by national and local energy efficiency agencies.

Some CIS energy importing countries have adopted energy efficiency policies. For instance, since the mid-1990s, Ukraine (one of the least energy efficient countries in the world and worst performer in the CIS) has developed a broad regulatory and institutional framework for energy efficiency, including a public agency and an EBRD-supported Energy Service Company (ESCO). Progress has been made, but slowly, in a context of low energy prices. Since the 2006 gas crisis and energy price increase, the country has stepped up and reaffirmed this priority in its 2006 Energy Strategy.

In Russia, although the 2003 Energy Strategy sets energy efficiency as a priority, it has insufficiently covered energy demand and has failed to establish adequate institutions[108] or put forward a concrete plan to reduce high energy intensity (and waste) both in the energy sector and in end-use sectors. Even if the regulatory and institutional framework is more advanced than for energy efficiency and pilot projects have been launched, Russia still lags behind most transition and developing countries. The main reasons for this include the supply-orientation approach of the government and energy companies and low energy prices, which make energy efficiency improvements financially unattractive. Nonetheless, niche markets (e.g. double-glazed windows) have been developed by the private sector.

One of the largest sources of potential energy efficiency in Russia is reduction of gas waste over the supply chain and use. In 2004, gas flaring was estimated at 15 bcm/y, according to the IEA (2006b) and World Bank Gas Flaring Programme, with transmission and distribution losses at 11.5 bcm, while gas consumption for pipeline compressors amounted to 41 bcm. The potential gas savings are significant and have been estimated at least at 29 bcm a year, or almost 25% of Russia's annual exports to the EU. This potential includes reducing gas flaring (15 bcm), which could be almost fully phased out (mostly in oil fields), reducing Gazprom's transmission and distribution losses (6 bcm per year) and optimising compressor efficiency (8 bcm). In addition, large potential exists in the electricity and heat generation sector, as well as in end-use consumption sectors, whose economic potential for savings would need to be precisely estimated. Farrell et al. (2007) estimate the potential reduction in energy demand in the Russian gas and heat sectors after the removal of subsidies in the residential sector only at over 40% of projected fuel

[108] The Russian Ministry of Energy does not have an energy efficiency department.

demand in 2020, twice the level of potential savings in LPG/kerosene in China and India. Significant saving potential and opportunities exist in other CIS countries.

In addition, reducing gas waste is eligible under Kyoto Protocol flexibility mechanisms and carbon funds (World Bank, EBRD), which can provide valuable co-financing of the initial investments. Similarly, a great potential for investment opportunities exist with the Kyoto flexible mechanisms to reduce emissions and energy waste.

In the Caspian region, the energy efficiency potential on both supply and demand sides so far has been largely neglected. In contrast, energy-poor and landlocked Armenia has since the 1990s developed an active energy efficiency policy to reduce its energy import vulnerability and electricity peak demand. A public agency (the Energy Strategy Centre) has been in charge of design and enforcement of sectoral action plans and managing cross-sectoral projects, notably with international co-funding.

6.4 Governmental and business external energy strategies

The CIS energy-rich countries have developed exploitation of resources for domestic use, but also increasingly so for exports. As illustrated in Chapter 3, export revenues (and fiscal receipts) play a very important role for these economies. This high dependency on energy exports explains the development of complex external energy strategies, which have been mainly developed by governments, although major state-owned companies also play a key role in their implementation and partly also in their design. Thus, corporate and political energy strategies are closely interlinked and very comprehensive if compared with other business strategies developed by the CIS countries. They involve top-level decision-makers in the governments and energy companies, given the substantial role of state-ownership and close personal connections between political leadership and energy sector management.

The level of organisation and resources put into the development and implementation of CIS energy strategies contrasts with the little co-ordinated energy policies of EU member states, not to mention at the EU level. This difference in strategy design and implementation gives major CIS producers, and in particular Russia, the possibility to anticipate and rapidly react to EU initiatives in the energy sphere.

This section highlights some features of the CIS external energy strategies in the context of the energy supply chain to the EU (upstream, midstream/transit and downstream).

6.4.1 Russia[109]

Key features of the strategy

The 2003 Russian Energy Strategy set as a clear priority the development of the export potential of the energy sector with expansion in the CIS, Europe and Asia. The increase of state power in the oil and gas sectors, as discussed in section 6.3 above, gave the Putin administration a very strong position in shaping and implementing external energy policy, whereas domestic private players have limited options for pursuing their own business agenda, even if they have diverged from state policy. An important additional factor is that there are strong personal linkages

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[109] This subsection is based Łoskot-Strachota (2006, 2007a) and Centre for Eastern Studies (2007).

between key policy makers and management of the major state-owned energy companies, and as such in some instances one can speak of an interplay between state, company and personal interests.

Russia does not hide its intentions to use energy commodities also as a geopolitical tool (Russian Government, 2003). Therefore, preservation or even strengthening of Russia's position as the most important supplier of gas and oil to Europe has become an important objective of Russia's energy strategy (Loskot-Strachota, 2006). In this document Russia states its aims to utilise energy policy for security purposes (Leijonhielm and Larsson, 2004). Indeed, security is understood as the ability to control production and transit routes and secure demand for preferential prices. To achieve these intentions Russia is increasing its presence in upstream and downstream projects, transit routes and plans to construct new ones.

The trend towards greater state involvement and control in the energy sector can be explained with reference to various factors. On the one hand, there are legitimate motivations for regulation of operators and markets, market expansion, diversification of exports, integration of upstream with downstream, as well as security of transit conditions. On the other hand, some observers have pointed to the dominant presence of rent-seeking motivation (and behaviour), aimed at gaining and maximising specific short-term political and economic advantages without proper accounting for the medium- to long-term. The preservation of short-term individual interests by Russian policy makers (who have substantial leverage over companies such as Gazprom) and subordination of Gazprom's commercial policy (or Russia's energy policy more generally) to foreign policy objectives are mentioned by some authors as the main factors explaining Gazprom's investment and production policy (for a typical presentation of such view see e.g. Paillard, 2007).

Russian oil and gas companies continue to expand internationally, acquiring assets in the CIS energy sectors and more recently also in the EU. A more detailed account of this trend is given below. The primary goals of their strategies seem to be retaining or even increasing Russia's share of oil and gas markets and integration and control over the whole supply chain (exploration, transportation/transit, refining, trading, distribution and consumption – e.g. in power plants). Achievement of these objectives would allow an increase in profits (of both energy companies and personnel from the ruling elite connected with specific companies) and a strengthening of the international position of Russian energy companies, but would also support the Russian state in realising its strategic objectives (mainly in the area of foreign policy). This backing of the state's interests is especially visible in the case of Gazprom, and now increasingly with oil companies.

Apart from CIS and Europe, Russia's external energy activity and investments have also reached into Africa (Algeria and Nigeria) and the Middle East (Iran), i.e. countries that are important energy suppliers for the EU.

Gazprom has implemented expansionist policies in energy and non-energy (e.g. media) markets in CIS and EU markets. Such a policy is being realised at the expense of reduced investment in gas upstream activities and has led to a heavy build-up of debt. At the end of 2006, the debt to revenue ratio was around 50% for Gazprom, over 40% for Rosneft, while for other private oil companies in Russia and abroad the ratio was typically below 10% (Milov, 2007, see also Victor, 2008). Available estimates suggest that in 2006, and particularly in 2007, Gazprom's investments in gas production increased significantly compared to negligible levels up to 2005 (CASE Transcaucasus, 2008). In 2008, Gazprom announced changes in its investment policy in the next two years, aimed at further increasing investments in new deposits. It is hard to judge if the company will implement these plans and whether this signals a sustained change in its longer term investment policy.

High-priority large energy projects (e.g. Shtokman gas field, Nord Stream and South Stream pipelines) are typically consulted and approved with the active participation of the Russian president. Also, the general view is that even private companies pursuing their own interests are unlikely to act in a way that openly conflicts with the state's objectives given the experience of the Yukos forced bankruptcy.

Russia is a transit country for oil and from the Caspian region and actively uses its political and economic influence to block alternative transit possibilities.

The main impacts of the external strategy

The effects of Russia's external energy policies vary in different parts of the CIS and Europe, depending on domestic market structure, existing infrastructural and export dependencies (the degree of possible diversification of imports of energy supplies) and the level of development and strength of the domestic regulatory framework.

On the one hand, Russian acquisitions can play a positive role in the functioning of energy sectors in CIS countries. The functioning of the electricity sector in Armenia (where Russian companies are strongly represented) compares positively with several other CIS countries (although the causal positive relation between Russian investments and the functioning of the sectors may be questionable). On the other hand, a situation where imports of energy resources are concentrated in the same hands as internal energy infrastructure creates numerous economic risks and can be a serious challenge for regulators. The very strong position of Russian investors can also reduce competition, limit possibilities for entry of new players or their access to pipelines or the electricity grid.

The key controversy (not always stated openly) concerns the degree to which the strong market position of state-owned or state-controlled Russian companies can be used as "political leverage" to pressure other CIS or even EU countries. Past experience suggests that the potential for such pressures is much higher in the case of unreformed distorted energy markets (e.g. where gas import prices are well below economically justified levels). Irrespective of the objective assessment of this risk one should remember that intra-CIS co-operation in the energy sphere is often severely influenced by such reasoning. This affects the actual behaviour of governments of CIS countries, where Russian investors are present or are contemplating an entry, and this may also affect the actual strategies of Russian investors.

The orientation of the external strategies has resulted in the following:

- Strengthening state control within the country through direct intervention and national energy companies,
- Successful expansion of Gazprom (and to a lesser extent of Rosneft) in the oil and gas sectors, as well as in electricity generation and nuclear equipment in Russia and abroad,
- Adopting new legislation to toughen the mechanisms of foreign participation in Russian sectors considered strategic (above all energy); foreign companies face less predictable and more difficult conditions (license legislation, ecological control, new investment agreements, etc.),
- Preventing direct European access to Caspian energy resources, notably by signing long-

term purchase contracts with these producers and considering creating a so-called gas OPEC,

- Ensuring Russia's control of energy infrastructure in the CIS, but also abroad (strengthening Gazprom, UES and their acquisitions). Russia controls the deliveries, sales and distribution of gas through Gazprom companies and joint ventures; acquires pipelines (or builds new ones), oil refineries, electricity grids and ports,
- Strengthening bilateral negotiations and agreements, notably extending long-term gas supply contracts, with separate European governments and energy companies.

Gas sector

Russia's external energy strategy seems most homogenous in the gas sector, where it is mainly implemented by a single actor, i.e. Gazprom. Gazprom makes the bulk of its profits on exports to non-CIS, mainly EU markets (accounting for around 30% of sales volumes and around 63% of sales revenues in the first three quarters of 2007), with exports to CIS markets accounting for 18% of volumes and 27% of revenues, while domestic sales (53% of the total volume) are likely to generate losses, bringing in only 12% of sales revenues.[110]

Gazprom's external energy strategy can be summarised (Łoskot-Strachota, 2006; Łoskot-Strachota, and Pełczyńska-Nałęcz, 2008) as aiming to:

- Retain monopoly power in gas production and transmission in Russia by preventing independent gas producers and oil companies to access directly the gas networks and (domestic and export) markets. Gazprom's control of upstream has been reinforced by its successive purchase of several independent gas companies. On transmission, Gazprom largely applies self-regulation, which the grip regulator has little opportunity to challenge. Finally, the "single export point" regulation from 2006 confirmed Gazprom's overarching power on trade.
- b) Maintain control over Caspian region gas exports, which would:
    - guarantee stable supplies of relatively cheap Caspian gas to Russia. In the short-term, Caspian gas is a central element in Russia-Ukraine energy relations as Russia plays the role of an intermediary (through a system of offshore gas intermediaries such as RosUkrEnergo) and transit operator for large gas flows mostly from Turkmenistan to Ukraine. Gazprom has sealed various large long-term gas purchase agreements with Caspian gas producers (Turkmenistan, Kazakhstan, Uzbekistan).
    - limit the possibility of independent (Russian) access of Caspian gas to the EU market. In this context Russian energy policy is about increasing Russia's role in Caspian gas transit (the Caspian gas pipeline project), a tactical alliance with China in Central Asia, blocking westwards route development (the Transcaspian gas project) or attempting to use them for Russian gas (Nabucco, Turkey-Greece-Italy Interconnector).
- Gaining ownership and control of the CIS's midstream and downstream gas sectors for the reasons indicated above (anticipating/blocking supply diversification of CIS and European

[110] Data are taken from the Gazprom's consolidated interim financial results under international financial reporting standards for the first nine months of 2007, http://www.gazprom.com/eng/news/2008/02/26998.shtml.

market, using economic opportunities arising from a strong market position in these markets). The extent of Gazprom's acquisitions in the CIS is detailed in Table A6.1 in Appendix 5.

- Opening new export routes enabling diversification of export channels, reducing reliance on traditional transit countries and raising export volumes. Yamal-Europe and Blue Stream pipelines have both enabled a reduction in levels of reliance on transit through Ukraine, while recent plans for Nord Stream and South Stream pipelines may limit the transit leverage of Belarus, Poland and to a lesser extent also Ukraine. Entering the LNG market could increase the chances of entering more new markets.
- Increasing control over existing transit routes in third countries. Gazprom has shares in transit infrastructure in Belarus (12.5% in Beltransgaz as of 2007, gradually increasing up to 50% in 2011), Moldova and Poland. The strategy has so far not being successful in the case of the key transit country - Ukraine.
- Increasing its influence and flexibility of operations on the EU gas market, strengthening its market position in Europe. This is achieved by accomplished or planned direct acquisitions of assets in key EU infrastructure: interconnectors (10% in the Zeebrugge-Bacton, Balgzand-Bacton/BBL), gas hubs (50% in Baumgarten) and underground gas storage facilities (e.g. Haidach) – see detailed information on Gazprom's acquisitions in the EU in table A6.2 in Apendix 5. Gazprom has also extended long-term gas sales contracts with some key customers e.g. in Germany and Italy (see Table 5.2 in Chapter 5).
- Stronger engagement in the downstream segment of the EU gas market. Gazprom aims at profiting from EU market liberalisation and wants to increase its share in gas sales to final consumers notably by acquiring distribution companies (control of Baltic gas companies, German Wingas) and agreements for direct sales (France, Italy). Russian monopoly acts directly or indirectly via its subsidiaries (like Swiss RosUkrEnergo in Ukraine and beyond, Czech Vemex, Hungarian Emfesz, Austrian Centrex, etc.) or joint ventures (e.g. German Wingas).
- Increasing investments in European gas intensive industries (power generation, petrochemical). Examples include investments in BorsodChem, TVK in Hungary, gas-fired power plant in Kaunas (Lithuania), etc. (Gazprom is also increasing its already very important role in the Russian power generation industry)..

To achieve these governmental and corporate goals, Gazprom uses different tools, including:

- different types of contractual arrangements, with long-term contracts accompanied by different clauses, such as specific provisions for Gazprom's access to the downstream market; in the case of transit countries (Ukraine, Belarus) these have been used to link supply arrangements with specific transit deals or with certain provisions for trading companies,
- negotiations on both business and political levels on a bilateral basis (avoiding any sub-regional or EU coordination), using political leverage if needed and possible due to close connection with Russian government and diplomacy.
- partnership with EU companies in priority projects (e.g. Total and StatoilHydro participation in Shtokman Development company; Yukos assets acquisition by ENI; E.ON and ENI investments in Russia, Nord Stream project – cooperation with E.ON and BASF and the South Stream project – in cooperation with ENI).

Very ambitious acquisition plans in various businesses globally imply a reduction of financial resources available to projects updating existing production and transport facilities (e.g. in limiting losses), and the development of new fields, such as Shtokman or the Yamal peninsula. Several authors have raised concerns that this will eventually threaten production potential in the medium- to long-term[111].

Oil sector

The external strategies of oil companies, the Russian government's focus on CIS and European markets, which is currently the main outlet for Russian oil exports, and the different characteristics of the oil sector (a global market for oil, more flexibility in supply routes, much stronger private sector presence and lower concentration in the Russian oil upstream sector) differentiate the gas strategies discussed above from strategies in the oil market.

The key instrument that remains at the disposal of the Russian government is that Transneft, the state-owned transport monopoly, closely controls volumes and directions of oil exports from Russia. Transneft owns and controls almost all oil export pipelines on Russian territory (with the exception of the CPC Tengiz-Novorossiysk pipeline).

The participation of various Russian companies in oil exports translates into a less unified external strategy than is the case with gas. This is also related to a smaller influence of particular oil companies on the recipient market – while aggregated volumes of Russian oil constituted about 32% of EU imports in 2006, exports of the then largest company Lukoil accounted to only 8.5%.

The general objectives of Russia's strategy concerning oil exports can be summarised as follows:

- Increasing influence on strategic elements in oil transit infrastructure. In particular Russian oil companies have been trying to take over oil terminals in the Baltic States (Butinge in Lithuania and Latvian Ventspils), and other elements of transport infrastructure (CPC Tengiz-Novorossiysk pipeline, Odessa-Brody, reversal of Adria), attempts to influence the conditions of oil transit via the Belarussian part of the Druzhba system and the promotion of new export outlays (Burgas-Alexandroupolis project).
- Increasing export capacities not relying on third country infrastructure (e.g. expansion of Baltic Pipeline System, Primorsk oil terminal, a discussed pipeline to Murmansk).
- Retaining at least some control over oil exports from other CIS producers (especially Kazakhstan), e.g. via blocking the expansion of the CPC pipeline, engaging Kazakhstan in common oil export projects (Burgas - Alexandroupolis).
- Expansion in the CIS and South East European (Bosnia and Herzegovina, Bulgaria, Serbia) downstream sector.

Russian oil companies have expanded into the CIS downstream segment although their operations there have in some instances been complicated by local market regulatory issues (see box 6.4 on Russian oil companies in Ukraine). In Ukraine, LUKOIL, TNK-BP and Tatneft together control most of the country's oil refining capacity and petroleum products market. In addition to large petroleum retail chains, LUKOIL and TNK-BP operate upgraded oil refineries in the country (Smith, 2003). In Belarus, Slavneft controls 44% of shares of the Mosyr refinery (one of two

[111] See e.g. http://www.energypublisher.com/article.asp?id=11200.

existing in the country). Russian companies are also active in Kazakhstan, Uzbekistan and Azerbaijan. LUKOIL owns oil refineries in Bulgaria, Romania and Ukraine, and has been active in wholesale and retail sales of petroleum products in several EU countries (LUKOIL, 2007).

Apart from LUKOIL, Neftegazinkor, a subsidiary of state-owned Zarubezhneft, has invested in the oil refinery of Bosanski Brod (capacity: 1.5 Mt) in Bosnia and Herzegovina (Republika Srpska). Also, in early 2008, the Russian government reached an agreement with the Serbian government for GazpromNeft to acquire (without a tender procedure) the national oil company NIS (oil and gas production, oil refining and retail), for a price of around EUR 0.4 billion[112]. Following the significant strengthening of their internal position Rosneft and GazpromNeft are commonly expected to become more active on international markets.

Russian companies are also involved in CIS oil upstream. Since 2003 (since the start of Yukos's problems) LUKOIL has been the main Russian oil company actively investing abroad. Its CIS portfolio includes oil and gas exploration projects in Kazakhstan (e.g. Karachaganak), Azerbaijan (Shah Deniz) and Uzbekistan. It was also active in upstream projects in Iran, Saudi Arabia, Iraq, Colombia, Venezuela and Ivory Coast.

Box 6.4 Russian investors in oil refining in Ukraine

During the 1990s, the Ukrainian oil refining sector experienced a deep crisis with a drastic decline of production related, inter alia, to limited crude imports from Russia and Kazakhstan (domestic crude production is low). The privatisation process that started in 2000 resulted in Russian companies gaining control of a large chunk of the refining sector. Currently, four out of six refineries are controlled by Russian investors: TNK-BP (Lisichanski NPZ), LUKOIL (Odesski NPZ), UkrTatneft (Kremenchugski NPZ, 47% of market in 2006), Aljans group (Hersonski NPZ).

After privatisation, the output of the sector increased significantly (almost doubling between 2000 and 2001), improving fuel supply to local markets and pushing down prices. However, after 2004 refining levels started to decline substantially. This is related to a combination of factors. Firstly, the existing refineries have outdated technologies and produce very low quality fuels. Major upgrading is necessary, and did indeed start to take place, e.g. in Odessa, which was closed in mid-2005 for major reconstruction and modernisation. Secondly, Ukrainian policies have at times strongly discouraged market development, such as when the government pressured producers to keep the petroleum prices stable through temporary bans on oil and oil products exports. More generally, the combination of difficult political relations between Russia and Ukraine and perceptions of the behaviour of Russian investors in terms of "expansion" into domestic territory, combined with outdated, inefficient technology and attempts to intervene in the market by administrative measures, have proved rather detrimental to the development of domestic oil refining sector.

Source: Ukraine background note, company reports.

Electricity

Also in the power sector, RAO UES, the Russian national electricity company has been expanding abroad, in particular in the CIS (see Table A6.2 in Appendix 5). Since the early 2000s, UES has acquired stakes in electricity generation and distribution companies in eight CIS countries – Armenia, Belarus, Georgia, Kyrgyzstan, Kazakhstan, Moldova, Tajikistan, and Ukraine (Berdikeeva and Mark, 2003). In many cases, the acquisitions were made at very low

[112] "Alarm at Gazprom's Serbia move"; Financial Times, 30 December 2007; "EU warns Serbs on Russia gas deal"; BBC, 10 January 2008

prices, using schemes such as “property as a debt payment”, “writing off the debts to Russia” or “property as a guarantee for temporary cheap energy supply”.

6.4.2 Kazakhstan[113]

Kazakhstan’s external energy strategy objectives is aimed at increasing export potential but also at diversifying export routes and equilibrating influences of third countries in the Kazakhstani energy sector. The country is attempting to avoid excessive dependency on one political/economic partner. In recent years the role of Chinese companies in the Kazakhstani energy sector has been on the rise. In 2006, Kazakhstan opened an oil pipeline to China (present capacity 10 Mt annually, to increase to 20 Mt) and is working on a gas connection. These developments are designed to counterbalance traditionally strong ties with Russia and the substantial engagement of western energy investors in Kazakhstani oil and gas. Still, while developing a Chinese direction for exports Kazakhstan is also weighing western options (via the South Caucasus and Russia) and southern options (via Iran).

KazMunaiGaz has become one of the key vehicles for Kazakhstani foreign investments. KazMunaiGaz has been trying to enter European downstream for some time (e.g. it participated in tenders for Lithuanian Mazeikiu and Czech Unipetrol), and succeeded in 2007 with the acquisition of a majority stake in Romanian Rompetrol[114]. Kazakhstan is also becoming a regional leader in investments in the Caucasus / Caspian investments with acquisitions in Georgia (gas distributing company in Tbilisi, Black sea oil terminals) and projected investments in Turkmenistan. Increasing co-operation between Kazakhstan and Turkmenistan may lead to some coordination of the external energy policies of these two countries.

6.4.3 Turkmenistan

The handover of power after the death of president Niyazov in December 2006 was seen a possibly turning point in economic, and in particular energy, policies and for opening to external actors after years of self-imposed isolation. The country enjoys growing interest not only from its traditional partner in gas trade (Russia) and China but also from other Asian countries, as well as the EU and US, which have had sparse relations with Turkmenistan to date. Turkmenistan appears to be abandoning its policy of isolation and is trying to attract foreign investors. Its goals can be characterised as follows:

- To boost gas output by investing in new hydrocarbon deposits. The government is ready to allow foreign investments into its Caspian offshore deposits (volumes difficult to estimate, some of them disputed), and it has called for offers for specific block exploration. However, Turkmenistan's biggest discovered gas deposits are located onshore, and in these areas the state company and Chinese and Russian investors have strong positions.
- To maximize its gas export profits - by raising gas export prices and the capacities of existing export routes. Russia continues to be the main outlet for Turkmen gas (receiving 42 bcm or about 85% of total exports in 2006), which is then mostly sold on to Ukraine and various other countries (RosUkrEnergo plays a key role in this trade). Besides, Iranian and Chinese companies, which are engaged in the development of onshore gas deposits, have

[113] This subsection is based on: Łoskot-Strachota (2007b)

[114] KazMunaiGaz bought 75% of Rompetrol, the transaction value was estimated at USD 2.7 billion. Rompetrol has two refineries with a total capacity 5.5 Mt annually and around 630 gas stations in various countries.

started construction of a gas export pipeline to China. Increased recent interest from various investors has increased the bargaining power of Turkmenistan, e.g. helping it to negotiate higher gas prices for deliveries to Russia.

- In the longer term, to diversify its export routes, following the example of Kazakhstan. It is probable that the two countries will coordinate their external energy policies. However, it is difficult to assess the actual export potential of Turkmenistan and thus also which export routes might be economically justified. It is still impossible to tell if a westward (and independent from Russia) gas pipeline for Caspian gas could be built and what route it might take (realisation of both Transcaspian and Turkmenistan-Iran-Turkey variants seem difficult).
- To increase oil production, refining and petroleum products exports. To this end, modernisation of the two major Turkmen refineries is being carried out.

6.4.4 Azerbaijan

Azerbaijan has been consistent in its energy policy for the last decade, aiming at exporting its hydrocarbons westwards. In addition to its initial export routes (Baku-Novorossiysk and Baku-Supsa pipelines and expanding the railway connection with Georgian Black Sea terminals), the country has, together with energy companies, been engaged in the Azerbaijani energy sector, developing the Baku-Tbilisi-Ceyhan (BTC) oil pipeline. The BTC is now the main export outlet for Azerbaijani oil to international markets.

Azerbaijani crude will fill the BTC capacity over the next few years (during the peak production period). Beyond this there will likely be spare transit capacity in the BTC. Therefore, negotiations over Kazakhstani participation have been continuing. Azerbaijan already plays some role as a transit country for Caspian hydrocarbon reserves: Kazakhstani oil is being transported by railway via Azerbaijan to Georgia’s Black Sea ports (Batumi and Poti).

In the coming years, external energy policy will be concentrated on the development of export corridors and ensuring an increase in transit volumes. Besides this, the leading state-owned company SOCAR is also seeking engagement in European oil downstream and has already invested in Turkey.

6.4.5 Ukraine, Belarus and Moldova

As discussed in Chapter 3, several CIS countries play an important role in transporting oil and gas from Russia and the Caspian region to European markets. Ukraine and Belarus are the most important countries in this respect, while the role of Georgia is expected to rise and Russia is also an important corridor for gas and oil from the Caspian Sea region. Given the economic importance of transit-related revenues and economic, as well as political leverage, that the pipelines give to transit countries, their policies are worth a separate discussion, which we provide in this sub-section.

The general policy objectives of transit countries are easy to identify: they are eager to maximise their role in oil and gas transit by increasing own transit capacities and limiting alternative options through other countries. They also typically strive to maintain state ownership of the transit infrastructure and in particular try to avoid selling pipeline infrastructure to the oil and gas producers relying on it.

Belarus and Ukraine play significant roles in oil transit. However, the amount of transited oil has been decreasing in recent years. The main reason for this is the diversification of oil transit flows by Russia and development of the new Baltic Sea terminal in Primorsk (opened in 2001 with gradually increasing export capacity – by 2006 it was already as important an outlet for Russian exports as the whole Druzhba system) and increased use of Black Sea ports (mainly Novorossiysk), as discussed in section 6.4.1. Indeed, in 2003 transit of oil through Belarus to the Latvian terminal Ventspils (around 8 Mt annually) was stopped (re-routed to Primorsk). Then, mid-2006 witnessed a halt in transit to the Lithuanian refinery Mazeikiu (around 8 Mt annually), which was officially ascribed to the technical conditions of the pipelines, although some observers interpreted this as an economic response by Russia to the decision of the Lithuanian government to sell the Mazeikiu refinery to the Polish oil company Orlen, and not Russia's LUKOIL.

In 2000, Ukraine transited 43 Mt of crude oil, although the volume decreased to 33 Mt in 2006 (39.7 Mt in 2007). Ukraine has been planning to increase its importance by opening a route for Caspian oil deliveries to Europe. This was the primary motivation behind building the Odessa (Black Sea oil terminal)-Brody (on the Polish border) pipeline in 2001. Due to poor business planning and the lack of commercial interest from suppliers and European refiners the pipeline (with a 9-14 Mt capacity) was not used and not extended to Plock (Poland). After a few years of inaction it started to be used in reverse mode, transporting Russian oil from Brody to Odessa and then through the Black Sea to international markets. There have been attempts to bring new life to this project and five countries (Azerbaijan, Georgia, Lithuania, Poland and Ukraine) have agreed on a new business project aimed at finishing the pipeline according to the initial plans and supplying Caspian oil to Europe. However, the rationale and economic profitability of this project have raised doubts among many experts, first of all due to the unwillingness of Kazakhstan to participate.

Ukraine continues to be a major transit route for Russian gas and this will not change anytime soon (even after the opening of the Nord Stream gas pipeline). It possesses a well-developed network of gas pipelines and underground gas storage capacities with active storage volume of 32 bcm. In 2006, Ukraine transited 128.5 bcm of gas (roughly 75% of Russian gas exports outside the CIS) – the large majority of which (112 bcm) was to EU markets. The role of Belarus in the transit of Russian gas has increased since the opening of the Yamal pipeline and an increase in its capacity during 2000-2005. The transited volumes are much lower than in the case of Ukraine, but still significant. In 2006 Belarus transited 44.2 bcm of Russian gas, 70% of which was via the Yamal-Europe pipeline, while the rest was covered by Beltrangaz.

Mutual dependency and conflicting interests result in problems, which occasionally affect other European recipients of Russian gas, with accusations of oil and gas siphoning, sharp gas price hikes and disruptions in gas supplies recently the most characteristic examples. Energy strategies in both Ukraine and Belarus (leaving aside Moldova due to its lesser importance in energy transit), bearing in mind the differences between the two countries, would currently appear to be mostly reactive to developments in relations with Russia, frequently also to the internal political situation (elections in Ukraine), with many current undertakings short-term oriented.

Some objectives of Ukraine's external energy policy (see IEA, 2006 and Pirani, 2007, for a review), unchanged for years, seem increasingly important today. This in particular relates to the goal of retaining state control over transit infrastructure. The government formed in late 2007 has also sought to change existing non-transparent gas import schemes, which are supposed to be eventually abandoned according to the March 2008 agreement with Russia.

In 2007, Belarus's energy situation was hit by Russian gas price hikes, but also by decreases in Russian oil transit (due to oil export diversification and the hike in export tariffs), leading to lower volumes of oil refined in Belarusian refineries and oil products exports. These underlined the central role of Russia, its energy and export/transit policy for Belarus's energy and economic security, with the political situation much more stable than it is in the case of Ukraine.

Moldova's importance in Russian hydrocarbons trade with Europe is lower. It seems also that its gas sector is dominated by Russian Gazprom – with a majority share in the company responsible for gas imports, transit and distribution. Moldova has built a new oil terminal at Giurgiulesti (operational since September 2007), aimed at diversification of its oil product imports and increasing its transit role, although it is hard to assess the economic rationale of this investment.

With major asset acquisitions and the stronger engagement of Russian energy companies in the energy sectors of Ukraine, Belarus and Moldova, these countries' position in relations with Russia may have weakened. This is especially visible in the case of gas, where the Gazprom monopoly has started to enter different segments of the gas sector. In addition, the planned construction of new and very large gas export pipelines to Europe (Nord Stream and South Stream) will further weaken the position of these transit countries. Paradoxically it also seems that increasing gas export prices to European levels, however harmful to domestic economies in the short-term, could result in reducing energy waste and intensity and therefore diminish Russian leverage on these countries.

6.4.6 South Caucasus

Georgia

The development of Azerbaijani oil and gas export pipelines has resulted in Georgia's increasing transit role. Besides oil and gas pipelines, Georgian transit infrastructure consists of railways and oil terminals (2 of them owned or co-owned by KazMunaiGaz and SOCAR) on the Black Sea coast. The BTC pipeline considerably increased Georgia's place and importance as an oil transit country. In the future it may transit up to 50 Mt of oil annually, although the current level (at the turn on 2007/2008) is around 30 Mt. In addition, Georgia hosts the Baku Tbilisi Erzurum (BTE) gas pipeline. Depending on the further development of the Shah Deniz and other Caspian gas fields in Azerbaijan, Turkmenistan and Kazakhstan, the capacity of the new pipeline could reach up to 20 bcm per year. Current gas transit is still small.

Increasing the role of energy transit through its territory is a key element for Georgian energy security strategy, and indeed its overall external energy policy. By ensuring that Caspian and Russian oil and gas flows though its territory the country limits the possibility of supply cuts and increases its bargaining power in price and other disputes. Besides, transit revenues may eventually become a significant source of income. Given the difficult political relations with Russia, access to Azerbaijani gas has been a major factor in domestic energy policy. It is important to note here that given the ownership structure of the Georgian energy market, it was Russian state-owned companies (Gazprom and UES) that switched from Russian to Azerbaijani gas supplies for their Georgian subsidiaries.

For Georgia, ensuring the security and smooth functioning of its transit infrastructure still remains a difficult and important challenge given the domestic political problems and instability.

Armenia

Political difficulties linked with territorial disputes with neighbouring Azerbaijan and Turkey have limited the possibilities for Armenia to capitalise on its transit potential.

Armenia is bypassed by the South Caucasian pipelines from Azerbaijan to Turkey and suffered from gas supply disruptions during the Georgian-Russian gas conflicts (the country is supplied with Russian gas via Georgia). Armenia has therefore been working on alternative transportation projects. It has been developing an electricity and gas pipeline connection with Iran, aimed at diversification of its energy sources and increasing security of supplies. This goal has been partially achieved. The link has indeed been built and is operating (with Armenia importing Iranian gas and exporting electricity to the country), but control over the infrastructure was taken over by Gazprom. Some other general and possibly not very realistic plans have also been discussed, including the creation of the Iranian gas export corridor via Armenia with the existing pipeline extension to Georgia, Ukraine and Europe. However, economic justification for such a project may be dubious and, besides, Gazprom will probably not be eager to help in bringing Iranian gas to Europe.

Table 6.5 Energy transit infrastructure: ownership structure and operation, 2006-2007

	Operated by	Transit volume	Transit fee, state budget revenues	Problems, bottlenecks
Belarus				
Oil	Druzhba (Brotherhood): Gomeltransneft Druzhba and Novopolozk Druzhba 100% state-owned	78.8 Mt (2006) 70 Mt (2007)	Since January 2008: towards Poland – 2.8 EUR/t; towards Ukraine – 1.2 EUR/t (change from an earlier tariff set in USD) Transit revenues (2007): USD 196 million; state budget revenues (taxes) – USD 52 million	Russia has options to diversify oil export routes; poor physical condition - lack of investments
Gas	Beltransgas, JSC, majority state-owned, Gazprom share 12.5%, to increase to 50% by 2011 Yamal-Europe (Russian ownership, operated by BTG)	13 bcm (2006); 18.4 bcm (2007) 31.0 bcm (2007)	Transit fee per 100 km, charged by Beltrangas: USD 0.75 per tcm in 2006; increasing to USD 1.45 in 2007. Transit fee per 100 km via Yamal-Europe is USD 0.36 and 0.43 respectively. Belarusian transit revenues (2006): USD 235 m, state budget revenues (taxes): USD 52 m	Russia has options to diversify gas export routes Supply disruption threats during Russian-Belarusian negotiations on import gas prices for Belarus
Ukraine				
Oil	Naftogaz of Ukraine (Ukrtransnafta), 100% state-owned	>30 Mt	n/a	Russia has options to diversify oil export routes; poor physical condition - lack of investments

Gas	Naftogaz of Ukraine, 100% state-owned	113.8 bcm (2006) 112.1 bcm (2007)	USD 1.6-1.7 per tcm per 100 km	Possibility of disruptions in supplies in case of Russian-Ukrainian conflicts on gas prices Non-transparent schemes for gas imports
Georgia				
Oil	Baku Tbilisi Ceyhan (BTC) Baku-Supsa (did not work in 2007)	28.5 Mt in 2007 (up from 9 Mt in 2006)	USD 0.12-0.14 per barrel (BTC); USD 0.18-0.20 per barrel (Baku-Supsa) State budget revenues: USD 25.4 m (2006)	
Gas	Baku-Tbilisi-Erzurum	2.8 bcm in 2007	Tariff (transit fee) – 5% of total gas transported State budget revenues: around USD 10 million in 2007	

Note: JSC stands for joint stock company.

Sources: Compilation based on various internet sources.

6.5 EU strategy and response options

This section introduces the emerging EU energy policy, and its external component, and locates it in the context of the relations with the CIS. It provides an assessment of EU-CIS energy relations and suggests possible improvements.

The importance of energy-related challenges related to economic issues, geopolitics, social development and the environment has become increasingly recognised by the EU in recent years, boosting policy initiatives aimed at addressing these challenges. This has been accompanied and strengthened by increasing energy prices – fuelled by the continuous increase in world energy demand, declining domestic production and thus a clear trend toward increasing import dependency as well as a deterioration in political relations with some of the main oil and gas producing countries, notably Russia.

6.5.1 EU Energy Policy

Energy Package 2007

At the initiative of the European Commission (EC) in 2005 and backed by the European Heads of State and Government meeting at Hampton Court (United Kingdom) in December 2005, the EU initiated a broad process of developing and eventually adopting a common policy on energy. If these attempts are successful, it could become an important element of the EU's internal and also external policies. This process is also an opportunity for the EU to lead and anticipate the necessary transformations in the energy field in a controlled transition, create new opportunities for its economy and enhance the living standards of its population.

The overall objective is to develop a coherent, balanced (energy supply/demand) and global (EU/external; energy/environment-climate) joint energy policy, and make it effective. Reaching an agreement on such a policy appears to be a very difficult task given the diversity of the EU27's energy situations and objectives. Commissioner Piebalgs and the DG TREN have adopted a regular consultation process and public debate for the preparation of an energy policy, including a Green Paper on energy "A European Strategy for Sustainable, Competitive and Secure Energy" (European Commission, 2006), an integrated energy/climate change strategy "An Energy Policy for Europe" (2007, see box 6.5) and its recent proposal "Renewable Energy and Climate Change Package" (January 2008).

Box 6.5 An Energy Policy for Europe (January 2007)

In its preamble the EC paper "An Energy Policy for Europe" sets the scene:

"Energy is essential for Europe to function. But the days of cheap energy for Europe seem to be over. The challenges of climate change, increasing import dependence and higher energy prices are faced by all EU members. Moreover the interdependence of EU Member States in energy, as in many other areas, is increasing".

The paper lists the main policy priorities and goals:

"The point of departure for a European energy policy is threefold:

- combating climate change,
- limiting the EU's external vulnerability to imported hydrocarbons,
- promoting growth and jobs"

With an objective of "transforming Europe into a highly energy efficient and low CO_2 energy economy, catalysing a new industrial revolution."

The key objectives for the EU energy policy included:

- "To achieve at least a **20% reduction of greenhouse gases** by 2020 compared to 1990 with the explicit aim of moving towards an international alliance of developed countries at least with a view of reducing global greenhouse gas emissions by 2020 by 30%,
- To **reduce its global primary energy use by 20%** by 2020 or saving EUR 100 billion and around 780 million tonnes of CO2 each year,
- **To increase the level of renewable energy in the EU's overall** mix from less than 7% today **to 20% by 2020**
- 10% biofuel component in vehicle fuel by 2020, and
- To establish a real **Internal Energy Market."**

The Internal Energy Market has an important role to play as it "is essential to meet all three of Europe's energy challenges:

- Competitiveness: a competitive market will cut costs for citizens and companies and stimulate energy efficiency and investment,
- Sustainability: A competitive market is vital to allow for the effective application of economic instruments, including the emissions trading mechanism to work properly. Furthermore, transmission system operators must have an interest in promoting connection by renewable, combined heat and power and micro generation, stimulating innovation and encouraging smaller companies and individuals to consider non-conventional supply,

- Security of supply."

Sources: "An Energy Policy for Europe" COM(2007) 1 final; European Commission/High Representative paper "An external policy to serve Europe's energy interests", June 2006 S160/06; "External Energy Relations - from principles to action"; COM(2006) 590.

On the basis of this strategic vision, the **"An Energy Policy for Europe"** (or also known as the Energy Package) was approved by the EU Council of Heads of State in March 2007. The EC has also developed an **Action Plan** for the period 2006-2009. The EC has already achieved the following:

- Adoption of the Energy Efficiency Action Plan "Doing More With Less" (October 2006)
- Adoption of the Biomass Action Plan (December 2005)
- Energy/Climate Change Package confirming the objectives to reduce greenhouse gases (GHG) by at least 20% by 2020 (January 2008).
- Internal Energy Market (IEM): "The EU Electricity & Gas markets: third legislative package"; new legislative proposals to enhance competition and transparency of electricity and gas markets (September 2007)
- Within this set of proposals from the EC on the IEM, the principle is that an energy producer or supplier will not be allowed to own or operate energy transmission systems in the EU. Only companies that are fully and unambiguously separated and independent from commercial activities will be authorised to enter into transmission activities. This full unbundling requirement would equally apply to EU and non-EU companies. In addition, "*Non-EU companies cannot own a controlling stake in an EU network unless international agreements are in place which explicitly allow for this situation. In contrast, there are no restrictions on investments in generation, production and supply activities*." ("Explanatory Memorandum on the EU Electricity & Gas markets: third legislative package", European Commission, 2007). What remains unspecified is if this proposed regulation applies to all electricity and gas networks, transmission and distribution.
- **Energy Observatory** established at DG TREN to collect and analyse EU-energy related information and data with the proposal to expand it into an Office of the Energy Observatory.
- **The Network of Energy Security Correspondents (NESCO)**: established by the European Council in December 2006 with the objective of providing reliable and timely information on threats to the EU's external energy supplies and security, notably to anticipate or prevent crisis or emergency situations (e.g. gas supply interruption following the Russia-Ukraine crisis early 2006). NESCO contributes to linking the EU's external energy policy with its external relations and enhances cooperation and the flow of information between Member States and EU institutions. Each Member State nominates a correspondent from the foreign ministry and the energy ministry, with DG RELEX, in coordination with DG TREN, as the designated focal point.

As regards **trade**, "An Energy Policy for Europe" outlines that the " EU already speaks with one voice in negotiations of international agreements, notably in the field of trade. Ongoing and future international agreements, whether bilateral or with several countries at a time, can be used more effectively to establish legally binding commitments. These can extend to the reciprocal liberalisation of trading conditions and investment in upstream and downstream markets, and to the grant of access to pipelines by countries situated along transit and transport chains. Equally, they can be used to promote international trade in sustainably produced biofuels or environmental goods, or to the international pricing of carbon emissions."

External energy policy

In a global and interdependent energy context, a common EU Energy Policy should logically integrate an external (and crucial) component to guide the EU in its energy relations and cooperation with neighbouring and more distant countries and regions. The external EU energy policy is defined in various dimensions:

- Common goals and priorities;
- One voice approach (negotiations with foreign partners on bilateral, regional and international basis);
- Design and application of common/joint actions and tools.

The paper "An Energy Policy for Europe" already covered the main lines of this component, outlines its overall objective: "The EU and Member States must pursue these goals with a common voice, forging effective partnerships to translate these into a meaningful external policy. Indeed, energy must become a central part of all external EU relations."

The stated priorities for an effective external EU energy policy for 2006-2009 include:

- "The EC and its Member States should be a key driver in the design of international agreements, including the future of the Energy Charter Treaty and the post-2012 climate regime;
- EU energy relations with its neighbours are fundamental to European security and stability. The EU should aim to build up a wide network of countries around the EU, acting on the basis of shared rules or principles derived from the EU energy policy;
- To enhance relations with our external energy suppliers, further developing comprehensive partnerships based on mutual interest, transparency, predictability and reciprocity;
- To continue to develop closer energy relations with other major consumers, in particular through IEA and G8 or through intensified bilateral cooperation;
- Develop the use of financial instruments, via enhanced co-operation with the EIB and EBRD and the establishment of a Neighbourhood Investment Fund, to enhance the EU's energy security;
- To improve the conditions for investments in international projects, working for example to secure a clearly defined and transparent legal framework and appointing European coordinators to represent EU interests in key international projects;
- Promote non proliferation, nuclear safety and security, in particular through a reinforced cooperation with the International Atomic Energy Agency."

The EU's energy relations with the CIS have largely motivated the development of the EEP and are at the same time a crucial life test, as developed below.

EU-CIS energy policy dialogue and cooperation

EU-Russia

Despite a rich institutional framework and frequent meetings at technical and political levels, the EU-Russia Energy Dialogue has largely failed to meet its initial objectives[115] and to produce tangible and durable results since it was launched at the end of 2000. Furthermore, in recent years (especially after the EU enlargement of 2004 and the oil and gas crisis between Russia and Ukraine and Belarus) significant differences and even tensions on both energy security perspectives and interests concerning energy relations have emerged between the EU and Russia (see e.g. Monagham, 2006). The increasing control of the Russian state on the energy sector and its utilisation of energy trade, transit and investment as geopolitical tools have led to further politicisation of relations. The growth of antagonism in Russian energy policy (energy superpower, energy as a tool of foreign policy), real and unjustified threats vis-à-vis the EU (gas OPEC, new markets, a possible decrease of export potential) are other elements hampering constructive dialogue between the parties. On the EU side, some member countries, in particular from Eastern Europe, have somehow also politicised energy relations with Russia. Also, the initial proposal of the Commission to envisage a restriction for vertically integrated companies to own transmission assets in the EU was not well-received in Russia, although this regulation would also apply for EU countries. Besides, non-EU companies would have to sign an agreement with the EU (and not separate deals with countries and companies).

On the EU side, the main **constraints and challenges** have included:

- Lack of a unified and consistent view of EU external energy policy priorities, notably security and effective tools for implementing it. The need for greater coordination of the proposed energy security policy – a very broad approach (climate issues vs. external relations with main partners), lack of prioritisation of certain areas and sequence of action that would enable the envisaged goals (often too general) to be gradually achieved.
- Different and even contradictory energy approaches and priorities of various EU countries (or between groups of countries) on the approach and cooperation with Russia, including on the Energy Charter Treaty. A common approach and one voice, even at a minimum level, has been largely disregarded or neglected at the expense of bilateral and often opaque relations and negotiations between EU governments and energy companies with the Russian government and its energy companies. The Russian side has been wisely using various channels and "carrots" (e.g. the perspective of an eventual access to Russian upstream vs. Russian companies access to or control of mid and downstream) to divide EU countries and interests.
- Insufficiency of focal points and references for external energy relations (e.g. think-tanks for policy elaboration and discussion; DGs and/agencies for implementation of measures/policies and monitoring); insufficient human resources and training; lack of adequate information about CIS energy and the overall context (the 2004 enlargement has

[115] "An energy dialogue (…) will provide an opportunity to raise all the questions of common interest relating to the sector, including the introduction of cooperation on energy saving, rationalisation of production and transport infrastructures, European investment possibilities, and relations between producer and consumer countries. The planned ratification of the Energy Charter Treaty by Russia and the improvement of the investment climate will be important aspects in this context."; 'European Union - Russia Energy Dialogue', October 2000- http://ec.europa.eu/energy/russia/overview/index_en.htm; "First joint Synthesis Report" , September 2001 http://ec.europa.eu/energy/russia/joint_progress/doc/progress1_en.pdf

provided the opportunity to enrich expertise on these fields in EU bodies, starting with the Energy Commissioner). This results in a relative imbalance in relations and negotiations with the Russian authorities, which are well structured and receive the support of state-owned companies.

- Insufficient availability and dissemination of qualitative information and insights into CIS energy, in particular at the decision-making and national company levels. This probably explains in part why the EU has not sufficiently anticipated Russia's "power polices" based on re-nationalisation or re-control of a large part of the energy sector and expansion along the energy chain (e.g. upstream takeovers vs. Yukos and Shell in Sakhalin, pre-emption of Caspian gas and control of transit and downstream in the CIS and the EU). This policy is largely fed by high oil prices. At the same time, the Russian energy scene is increasingly complex and dis-uniform. In particular, various views exist in the governmental spheres about energy relations with the EU (confrontation and cooperation) and competition is fierce within political groups and companies.
- Uncompleted, in certain areas hampered and uneven liberalisation within the EU internal energy market. Lack of harmonisation with other energy objectives (e.g. liberalisation without ensuring enough infrastructure is in place, which is necessary for enabling greater competition – see Helm, 2007).

The future EU-Russia negotiations (even if not yet scheduled for the time being) for a new **Partnership and Cooperation Agreement (PCA)** and outcomes will be a crucial opportunity to test Russia's willingness in engaging in effective negotiations (and compromise) for a real long-term partnership based on mutual interests and values. In its foundation papers (European Commission, "Energy Policy for Europe", COM(2007) 1 final and "External Energy Relations - from principles to action"; COM(2006) 590), the external energy policy (EEP) set out ambitious goals for this negotiation: "to agree (with Russia) on the objectives and principles of energy cooperation in a balanced and mutually binding manner" and "confirming both market economy principles and the relevant principles of the Energy Charter Treaty, could also remove many of the current obstacles to Russia's eventual ratification of the Energy Charter Treaty." Another related objective relates to "regulatory convergence" "… and mutual benefits for the long-term could be anchored through creating a level playing field, predictability and reciprocity in terms of: (b) market opening, and fair and non-discriminatory access to transport networks, including for purposes of transit of energy products; (c) convergence of energy policies, legislation and regulations regarding the functioning of markets, including trade rules, as well as safety and security issues." Beyond the necessary regulatory convergence, the reciprocity principle is openly given a priority, although its enforcement and verification appear to be a real challenge, in particular in the context of Russia's discretionary regulatory and judicial systems.

The "Energy Policy for Europe" document also questioned Russia's ability to sustain and fulfil its contractual energy commitments: "With the current levels of investment in production, transport and distribution of energy products, concerns have been expressed that Russia may not be able adequately to satisfy the growing demand on both its export and domestic markets." Finally, this paper advocates cooperation priority on energy demand: "There should, therefore, be a strong joint effort to improve the energy efficiency of the Russian economy".

It will also be a test for the EU's emerging external energy policy and the readiness of Member States to adopt a more collective and community approach and policy, as outlined in the "An Energy Policy for Europe" paper: "It is essential that Member States have a common understanding on the proposed approach on the principles for a future energy partnership with Russia, to be considered in the framework of the post-PCA agreement."

The "Energy Policy for Europe" paper already clearly identified weak points in EU-Russia energy relations that need to be improved and key priorities that would embrace a global energy policy perspective with a strategic vision, common objectives and approach. Nonetheless, complementary **improvements** may be also considered useful:

- Within the external energy policy, to define a clear and comprehensive EU strategy on energy relations and cooperation with Russia that would be adopted at the Council level and regularly updated. During the preparation of this Strategy and its future regular updates to ensure effective links and interactions with policy think-tanks, in priority EU-linked (e.g. Institute for Security Studies-Paris within the Council) and energy and/or CIS-orientated.
- In line with the defined strategy, for the Commission to adopt a specific road map (with clear timelines and responsibilities). Ensure adequate human and financial resources within EU institutions (consider various options of focal point(s): External relations coordinator for energy, Special Representative by region/topic, Task Force(s), etc) in synergy between the various DGs involved (TREN, RELEX, TRADE, etc) and the Council; reinforce EC energy teams (in Russia and headquarters); regularly and independently monitor/evaluate the road map implementation and suggest adjustments/revisions.

Further to bilateral EU-Russia energy relations, important and rapidly emerging issues concern **operations**, **acquisitions and investments by CIS companies (**notably vertically integrated, mostly Russian) in energy infrastructure, companies and markets in the EU. Although the EU aims to establish an internal energy market, there is not yet common regulation of investment and operations of non-EU companies. Monitoring and enforcement capacities of energy markets and operators, in particular on energy trading, also remain national based only and generally weak.

The first dimension relates to the appearance and development of non-EU energy offshore traders (see box 5.7 in chapter 5).

A second layer of issues is related to non-EU energy companies' acquisitions of key EU midstream and downstream energy infrastructure and assets. Further to the possible non-application of EU corporate standards by investing companies, the acquisition and control of EU oil and gas midstream and downstream interests, and possibly electricity transmission and distribution pipelines and companies by vertically integrated companies, would de facto monopolise the whole supply chain. The fact that a single company could own and operate the entire energy/gas supply raises issues in terms of possible abuse of monopoly/dominant position, security of supply (concentration of supply and operation in a single operator, in addition non-EU based), the reduced ability of the country to diversify sources of energy/gas supplies and for clients to choose new suppliers, market transparency and demand-side policies that become more complex to undertake.

In its third legislative package on the IEM in September 2007, the EC proposed a full unbundling of electricity and gas transmission activities from commercial ones (production and supply). The restriction of vertical integration of production (generation) applies to both EU and non-EU companies. Such regulation based on competition protection grounds should also logically include downstream – a key infrastructure and market component – as well as trading. The adoption and enforcement of an adequate regulation to cover midstream and downstream investments by vertically integrated companies and the operation of offshore traders not complying with EU corporate governance standards would protect EU energy markets from interruption of supply by a defaulting operator, market manipulation and abuse of dominant position by insufficiently regulated monopolies or oligopolies. The enforcement of such regulation(s) by national administrations would benefit from an EU-wide capacity (e.g. EU Energy Observatory) to ensure a global and effective monitoring.

The third dimension relates to the reciprocity of investment provisions in the CIS for EU companies due to unfavourable national investment climates and their lack of effective investment protection. Russian (and Belarussian) unwillingness to enforce the ECT framework, and the incomplete representativeness of the CIS in the WTO (Russia, Azerbaijan, Central Asian countries are not members yet). Nevertheless, the application of the reciprocity principles should not lead to limiting the application of investment restrictions to vertically integrated companies, as developed above.

EU – Caspian region

At a Conference in Baku in November 2004, the EU and the countries of the Black Sea and Caspian regions launched an energy dialogue, known as the “Baku Initiative”. This initiative aims at progressive integration of Black Sea and Caspian Sea energy markets with the EU. Cooperation should, it stated, contribute to convergence of energy policies and regulation of trade, transit and the environment. It is also aimed at enhancing energy efficiency and modernising existing infrastructure, including power generation and crude oil and natural gas exports facilities. The Inogate Technical Secretariat in Kiev is coordinating the Baku Initiative.

EU relations with CIS energy producers in the Caspian region have been the focus of further attention in recent years. This has contrasted with the EU presence and institutional engagement in other spheres that can have been described as secondary. The rather declarative Baku initiative of late 2004 - integrating Caspian, Caucasus states and their neighbours - has been aimed at facilitating EU energy relations with this key region. In 2006, the EU (European Commission) signed a Memoranda of Understanding on cooperation in the energy sector with Azerbaijan and Kazakhstan and announced one with Turkmenistan (2007). In 2007, the German Council presidency’s objectives included the EU-Central Asia Cooperation Strategy (all sectors), while the visits of EU commissioners to the Caspian region initiated a framework for dialogue with the region's oil and gas producers. Also, already in 2005 the EU appointed a Special Representative for Central Asia (including the Caspian region).

This has been accompanied by individual initiatives of particular EU countries seeking diversification of their energy sources – e.g. the 2007 energy security summits in Krakow and Vilnius initiated by Polish and Lithuanian leaders aimed at strengthening relations with key CIS transit/producers states. Still, the EU presence in the region (especially in the Caspian) is weak in comparison to other players (Russia, the US, China) and there have been no tangible effects so far of the recent more active policy there.

Barriers in EU – Caspian energy relations are in some aspects similar to those with Russia, but specifically include in this case:

- Apart from the EU-Central Asia Cooperation Strategy adopted in 2007, there is a lack of concrete and elaborated vision for a long-term strategy on energy relations with Caspian energy producers.
- Despite significant budgets, the successive regional (Inogate) and national (Tacis) energy projects have largely failed to produce tangible results, notably synergies in terms of energy reforms and investment, in particular in energy transit; an independent evaluation of

programmes, notably Inogate, should bring useful lessons.

- The institutional links established by the EU in the region appear relatively weak, at least at the political level.
- The degraded state of public governance/democratisation/human rights appears not to be incorporated into a clear EU position in bilateral dialogue at the political level (also with transit states and to a lesser extent with Russia), potentially creating ambiguities.
- The EU is not considered a strong player in the Caspian region, which is necessary for credibility and durability (in contrast to the US, which does not need Caspian energy itself).

Possible improvements:

- Based on the principles and guidelines of the EU-Central Asia Cooperation Strategy and the Baku Initiative, defining a clear and solid EU energy strategy in relations with Caspian countries within the External Energy Policy component; develop a set of concrete priorities in energy cooperation and tools/ways of achieving it (e.g. how much the EU needs Caspian oil/gas, transport options, what space for cooperation/conflicting interests with Russia etc)
- Reinforce the role and competencies of the Special Representative to the region to act as an interface; strengthen the capacities of EC energy teams (in the region and headquarters)
- Explore options and ways of possible cooperation with Turkey and the US in the Caspian to develop synergies and increase EU policy effectiveness.

EU – Transit countries

There is growing awareness in the EU of the need to develop - separately from a dialogue with producer countries - relations with CIS transit states (Eastern Europe and South Caucasus). These are important for the EU as its main transport corridor of oil and gas, but also as some of its closest neighbours. In addition to the safety and efficiency of transport (and storage) facilities, any instability of internal energy markets would have effects (both indirect as direct) on EU member states’ energy markets security. Also, EU companies have economic interests in these countries. Some aspects of energy relations with CIS transit states are covered in the ENP framework, although it is arguable if that – covering a broad range of issues – constitutes an effective tool in the oil and gas sector. An important initiative was the Energy Community invitation to Ukraine, Moldova and Georgia to join as observers and ultimately to create a common energy market with the EU. The EC set up a Technical Energy Discussion Group with Belarus. This is a long-term process as the completion of the EU internal energy market is far from being finalised. There also seem to be some short-term EU objectives in East Europe to be addressed – stability and security of transit being the top priority in the context of regular tensions between transit states and Russia, and Russian plans to build by-pass pipelines, but also internal reforms enabling it to handle rising energy (mostly gas) prices. While bilateral energy dialogue with Ukraine has started, covering a broad range of issues, notably a potential free trade agreement (once Ukraine joined the WTO), there is no equivalent in EU relations with Belarus and the South Caucasus.

EU-Ukraine relations in the energy sphere are closely related to the general framework of political and economic relations and have thus tended to change in line with the often turbulent internal political dynamics in Ukraine. Since 2004, Ukraine has strengthened relations with the EU with a focus on energy, in particular oil and gas transit. In March 2004, Ukraine promised to adapt a regulatory framework, including on energy, to EU legislation. The European Commission through its European Neighbourhood Policy has supported energy reforms through technical assistance projects, notably on energy security (oil stocks), energy efficiency and electricity interconnection.

Specific **barriers** with transit states include:

- Bad relations with the current Belarusian authorities, a low level of political dialogue and lack of an EU strategy for dealing with the situation.
- Russian-Ukraine tensions and non-transparent trading-schemes (e.g. RosUkrEnergo, an intermediary based in Switzerland, acting on behalf of Gazprom between Turkmenistan and Ukraine in the export and transit (via Russia) of huge gas volumes (between 35 and 41 bcm annually). Lack of a comprehensive regulatory framework covering transit among CIS countries, as the Energy Charter Treaty applies only partially (given no ratification by Russia); insufficient or inadequate application of its principles (see also recent developments on Russia-Ukraine transit arrangements in section 5.3.3).

Possible improvements:

- Adopt a coherent policy towards transit states, acknowledging the autonomy of these countries from Russia (until recently it seemed as if it was convenient for the EU that western CIS countries' energy transit issues are dealt with via Russia).
- Reinforce the capacities of the EC energy teams (in the region and headquarters) notably by appointing Special Representatives for Eastern Europe and South Caucasus and ensuring close internal coordination and evaluation of activities.

6.5.2 EU technical and financial assistance and donor coordination

The EU has been a large energy donor to the CIS since 1992, providing technical and financial assistance on a wide range of sectors and topics. A key goal has been to assist some CIS countries' energy authorities to design and implement effective energy reforms. In particular, initial assistance based on best practices gained in other countries in transition to be able to autonomously develop and enforce energy strategies is crucial. In the reform process, priorities are adjusted according to the CIS administration's needs. They may include ways to reinforce efficient market-based legal and regulatory frameworks and their effective implementation. Also, with more advanced reforms, projects may include assisting the restructuring of state-owned energy companies, in particular enhancing corporate governance standards, accounting standards (toward International Accounting Standards and International Financial Reporting Standards) and unbundling monopoly activities.

Energy efficiency and climate change issues are the key areas offering substantial potential for EU involvement. EU actions could assist central administrations and agencies in developing overall action plans, including studies on energy-saving potential and regulation (e.g. appliance labels and standards, building codes). Kyoto Protocol flexibility mechanisms could also play a role in investment projects, notably energy efficiency. Already, several IFIs have been active on sustainable energy in the CIS, notably the EBRD through various instruments (credit lines to local banks, financial facility for investment, carbon fund).

EC technical assistance projects (managed in DGs in Brussels or decentralised in Delegations) will need to continue to ensure coordination with other donors, in particular EU bilateral donors (e.g. German kfW), IFIs (EBRD, EIB, WB), OECD and IEA (policy and studies), UNDP/UNEP (sustainable energy) and the Renewable Energy and Energy Efficiency Partnership (REEEP) (energy efficiency and renewable energy policies).

6.6 Conclusion

6.6.1 CIS energy reforms

Features and issues

The CIS energy sectors are facing very similar issues and challenges, while the evolution of reforms varies quite radically from country to country and from one sector to another. Within network industries, the most advanced is the electricity sector, notably in terms of restructuring and unbundling, while the gas sector is the least reformed, still largely monopolistic. In the oil sector, market functioning and oil product quality are far below European levels and standards despite the development of a private sector, and FDI in upstream and trade.

Even in the CIS countries that are more advanced in reforms, governments still cumulate the functions of policy-making, regulatory enforcement (with weak regulators) and ownership with a large state-owned sector. This concentration of power, leading to conflicts of interests and political interference, has been dominant in most countries. Since 2003, in Russia, this concentration has been spectacularly reinforced and combined with a partial re-nationalisation of the oil sector, partly reversing earlier reforms. In many CIS countries there remain persistently close links between political circles and the energy sector (especially in the largest state-owned companies). This in particular manifests itself in national companies' management retaining strong vested interests to control the sector, driven by short-term rent seeking, typically at the expense of reform progress.

The regulatory climate for investment and operation in CIS domestic energy sectors has remained more difficult and challenging than in the Central European markets. Tariff policies are treated as a substitute for social policies and sometimes driven by populist motives, making investment planning very difficult for energy companies. The rule of law and independence of the judiciary are questionable in most cases. Similarly, in many countries regulatory bodies (when existing) fulfil their functions only formally. In consequence, underinvestment is chronicle, use of modern technologies sporadic, energy sector losses and waste high and reliability of service and economic performance low.

Due to such a specific regulatory framework and unfinished reforms, the private sector and in particular foreign participation trends are somewhat peculiar. Large foreign players have been present in large upstream oil and gas projects since the 1990s, but more recently there has been a trend toward limiting their role and presence, especially in Russia and Kazakhstan. Smaller European CIS economies have been trying to attract foreign investments into the electricity sectors and other branches of the energy industry, with varying success. These in turn opened up possibilities for CIS companies, in particular Russian state-owned and private companies, to enter other CIS markets amid fears of increasing dominance over supplies, infrastructure and downstream/markets and monopolisation, but also potential political pressures and vertical integration at the expense of structural and market reforms and modernisation of the sector.

Despite significant energy-saving potential both in the energy sector and end-use sectors, policies have remained largely supply-orientated, neglecting such potential, also not too demanding technically and in some instances also easy and cheaply abatable (elimination of excessive gas network losses, improving the basic insulation of buildings, metering and regulation, performance standards for appliances, buildings and vehicles, etc.). Implementation of these energy saving measures would free up energy resources for export or reduce the energy import bill, help to improve higher competitiveness for businesses and lower energy expenses for households (which could partly offset the effects of any necessary tariff energy price increases).

Electricity

Most countries have sought to introduce modern regulatory and legal frameworks in their electricity sectors. Priority has been given to restructuring and unbundling and rehabilitating existing generation and network facilities. In Russia, the reforms initiated in 2001 have progressed well, with unbundling (separation of grid and regional generation companies, two of which were privatised in 2007, with the participation of large EU players), price reforms (payment in cash, reduced cross-subsidies) and preparation for competition (creation of regional wholesale markets).

However, in most CIS countries regulators lack independence and power, above all in setting tariffs, which are too low to cover adequate maintenance and replace outdated facilities in order to reduce outages, and high generation and network losses. Low prices, lack of metering, etc. also inhibit incentives for customers to reduce inefficient use of electricity, in particular for heating. These imbalances already generate deficits (shortage) and black-outs (e.g. in Tajikistan, Kyrgyzstan, Kazakhstan, and occasionally in a few regions of Russia).

Vertically integrated monopolies or oligopolies dominate the markets, largely preventing the emergence of a competitive playing field. Only a few independent grid companies existed across the CIS in 2007, raising doubts as to effective third party access. The introduction of wholesale or spot markets (Georgia, Ukraine) has largely failed because of non-payments, low regulated tariffs and lack of alternative (private) suppliers.

Natural gas (downstream)

In most natural gas sectors, state-owned vertically integrated gas monopolies combine commercial and regulatory functions, and maintain tight control over the sector's infrastructure in a largely opaque way. Structural and regulatory reforms have faced strong resistance. The restructuring process of gas companies, notably unbundling, has not been able to effectively develop, in particular in Russia, preventing access to the network (transmission and transit) for third parties (independent gas producers). Prices remain below full cost-recovery levels and there is cross-subsidisation despite successive price increases, including in Russia.

The persistence of insufficiently regulated state monopolies and under-financing has led to ageing and low-efficiency infrastructure and rising costs and uncertainties for production trends. Poor corporate governance and lack of transparency further deteriorate the investment climate. With its extensive growth, Gazprom has further reinforced its control and influence along the supply chain across the CIS and in particular in pre-empting Caspian gas access to EU markets. The performance of investments and assets over the medium-term has been largely neglected.

Effective structural changes in the Russian gas sector do not seem imminent, and appear unlikely until ageing infrastructure combined with high domestic consumption and export commitments create a supply gap. In gas-importing countries recent import price hikes may act as a stimulus for reform. It may well be that only such external pressure can overcome political resistance to reforms. Such non-reform inertia is also relevant for other semi-reformed sectors.

Oil and gas upstream

After a period of relative opening to foreign and/or private investments in oil and gas upstream in Kazakhstan, Azerbaijan and also in Russia, new private investments have been somewhat restricted in key producing countries (Kazakhstan, Russia and to a lesser extent Azerbaijan). Uzbekistan, despite some efforts to improve the investment climate, still remains unattractive to private investors (due to its unreformed energy sector, the dominant role of the state and lack of export routes not controlled by Gazprom). Turkmenistan has been recently trying to attract foreign investors after years of self-isolation, but the success of this strategy is yet to be seen (Chinese and Russian investors will likely have an advantage due to potential for gas export pipelines). In Russia itself, the abrupt re-control by the state of major oil and gas fields and assets from private investors (the Shell consortium in the gas export project in Sakhalin II; Yukos) has been followed by discussions on new projects with minority private participation (e.g. Total and StatoilHydro in Shtokman gas/LNG project).

Therefore, hydrocarbon extraction in the CIS is characterised by a significant and growing state presence and control. As an illustration, Russian state-owned oil companies have increased their share of total oil domestic production from only 15% in 2003 to over 30% in 2007 (with Rosneft alone accounting for above 20%), with anticipations it will reach 50-60% by 2010. Also, the government is strongly involved in the sector through exploration licensing and the pipeline monopoly company Transneft. Similarly, in the Caspian region, Kazakhstan is converging toward Russia with greater state involvement and direct control.

Oil downstream

Most refining capacities in CIS countries are privatised, while some countries (Belarus, Uzbekistan) keep majority control. Russia and Belarus account for most oil product exports to the region and the EU. In general, refining infrastructure is outdated and most products do not meet EU standards. However, some refineries (e.g. in Russia and Ukraine) are upgrading to fulfil EU fuel specifications.

On the retail fuel markets, while taxation of oil products has become significant in most countries, some prices are still subsidised in various countries. Wholesale and retail markets are largely controlled by a few mostly private operators (e.g. LUKOIL has a strong position in several CIS countries) with limited competition.

Reforms: options forward

We see two main external forces that could help in speeding up the reforms. The first is the increasingly apparent risk of energy disturbances related to insufficient energy supply, transit and distribution capacity. The second factor that could drive the reform process is related to price developments. Following the global oil prices, natural gas prices in Europe have roughly tripled since 2002. This has prompted an adjustment of prices in intra-CIS gas trade, a process that is still in the making and that could eventually bring gas and electricity prices to economically justified levels in several CIS economies.

To be effective and produce sustained results the expected reforms will need to rely on a strong policy and institutional framework, backed by reliable energy data systems, economic tools (demand forecasts and least cost supply plans) and regular evaluation and monitoring. An open discussion on policy options, as envisaged by the Aarhus Convention[116] would reinforce the reform process, although it might not be easy to implement.

This study, a critical review of analytical and advisory works across the CIS energy sectors (notably by the IEA), suggests that key policy and regulatory priorities for future CIS energy reforms would need to include the following elements:

- Progressively separate the government's energy policy-making functions from regulation enforcement (by independent and empowered regulators) and ownership of (more autonomous and accountable) state-owned energy companies.
- Establish or reinforce a clear and stable market-based regulatory framework for energy investment and operations, effectively and independently enforced under the rule of law; the framework would benefit from being compatible with international agreements such as the ECT (Energy Charter Treaty), the WTO and the EITI (Energy Investment Transparency Initiative). Introduce a profit-sensitive fiscal regime; consider best practices for specific investment regimes for upstream oil and gas balancing public interests and investors' perspectives.
- Gradually implement energy price and tax reforms to cover all costs and externalities; Replace energy subsidies and social (cross-subsidised) tariffs by full-cost recovery tariffs and direct and targeted support to the most vulnerable households supported by subsidy schemes to improve energy efficiency of buildings and appliances.
- Restructure the state-owned companies, unbundle their natural monopoly activities (electricity and gas transmission and distribution, and gas storage) from other activities to improve corporate governance and overall performance, consider privatisation when competitive conditions are met on markets.
- Ensure fair and open access for all licensed operators to energy resources exploitation, national transmission systems (under regulated third party access) and domestic and export markets under the control and rule of a regulator.
- Develop and enforce robust energy efficiency action plans with clear objectives and calendar both in the energy sectors and end-use sectors, backed by national and local agencies; develop synergies with environmental policies (mitigation of pollutant emissions), Kyoto Flexibility mechanisms investment projects and economic use of renewable energy, in particular small hydropower and biomass (wood, wood waste, biogas, agriculture waste, etc.).
- In major oil and gas producing countries establish or strengthen the functioning of "oil funds" to help in macroeconomic management.
- Establish budget lines and funds and promote their use in energy efficiency investment financing (Energy Service Company-ESCO, specific funds), environmental remediation, infrastructure investment and state administration modernisation, notably education and research.

Energy issues could continue to be prominently represented in the European Neighbourhood Policy and the Action Plans could potentially become an important factor enhancing energy

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[116] UNECE Aarhus Convention (1999) on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters- www.unece.org/env/.

policy initiatives, supported by the ENPI financing. The EU-Russia Energy Dialogue already includes several instruments dealing explicitly with internal reforms in the Russian energy sector, such as Thematic Groups on market developments and on energy efficiency activities of the Technology Centre, etc. There is probably substantial potential for strengthening such activities.

The Baku Initiative, involving all CIS countries including the Caspian states, which are not covered by the ENP, while focusing on a vision for long-term energy co-operation, also includes several elements that are important for internal reforms of energy sectors (e.g. Working Groups on Harmonisation of Legal, Regulatory and Institutional framework for market liberalisation, Sustainable development and Investment Attraction and Project Facilitation). The opportunities arising from this can be enhanced, although this may be somewhat complicated by the multilateral character of the instrument and the potential for a surfacing of conflicting interests related to international energy co-operation among partners of the Baku Initiative. In any case these forums could provide opportunities for the emerging EU external energy policy to strengthen its role and gain credibility.

If these initiatives are successful and lead to identification of good energy projects, the ENPI funds will provide CIS countries (on a demand-driven basis) with technical (consultancy, best practice identification and dissemination) and financial assistance. The focus should continue to be on assisting national administrations to autonomously develop coherent, market-based and sustainable energy and environmental strategies and action plans backed by domestic ministries and agencies (regulators, energy efficiency agencies).

These projects could help CIS country authorities to develop or reinforce efficient market-based legal and regulatory frameworks and in their effective implementation. This would be complemented by assisting in the restructuring of state-owned energy companies, in particular enhancing corporate governance standards, accounting standards (toward International Accounting Standards and International Financial Reporting Standards) and unbundling monopoly activities.

Another priority field for EU involvement could be in projects related to energy efficiency and climate change, where EU actions could assist central administrations and agencies in developing overall action plans, including studies on energy-saving potential and regulation (e.g. appliance labels and standards, building codes). Kyoto Protocol flexibility mechanisms can also play a role in investment projects, notably energy efficiency.

EC technical assistance projects will need to continue to ensure coordination with other donors, in particular EU bilateral donors (e.g. German KfW), IFIs (EBRD, EIB, WB), OECD and IEA (policy and studies), UNDP/UNEP (sustainable energy) and the Renewable Energy and Energy Efficiency Partnership (REEEP) (energy efficiency and renewable energy policies).

In EU-supported and EU-financed activities it is important to clearly distinguish between supporting the optimal solutions from the perspective of respective CIS countries and fostering specific energy interest of the EU member states.

6.6.2 CIS external energy strategies

Domestic reforms in energy sectors are also linked – and often strongly so – to the production and export strategies of major producing countries and the largest companies, such as Gazprom, as well as the strategies of current and prospective transit countries. All these actors attempt to maximise gains from existing and future production, export and transportation opportunities. The major producers strive to enhance their market opportunities (expanding options for export market arbitrage, exploiting opportunities arising from monopoly control of existing transport infrastructure). Transit countries are keen to maximise the flows of resources through their territories. All this should also be viewed in a political context, as energy commodities have continued to be – particularly in the CIS area – also political commodities, where economic and political interests and pressures of countries, companies and individuals coincide in a complicated system.

The Russian government has been relatively open in declaring its external energy policies to be an important element of its foreign policy, particularly in the CIS area. Russia also aims, in the context of tensions on international energy markets, to acquire political leverage with its main energy client, the EU.

Gazprom has been the key vehicle of Russia's external energy strategy. The company has been continuously extending its direct control and integration along the gas supply chain through long-term gas purchase agreements from the Caspian region, control of transit and trading as well as the acquisition of distribution companies in the CIS and the EU. The most spectacular demonstration of this strategy is provided by a series of new large gas export pipelines projects ("Blue Stream", "Nord Stream", "South Stream"). At the same time, Gazprom is expanding internally and internationally also into oil, electricity and nuclear energy as well as several non-energy sectors (finance, media, etc.). For oil, Transneft, the national pipeline company, already coordinates export flows and is increasingly involved in the development of new export routes.

A characteristic feature of the Russian external energy strategy is a close cooperation between the energy companies (including private ones) and the Russian government in reaching bilateral agreements with CIS and European governments and energy companies. In various CIS economies, control with little transparency of energy imports and facilities by the same hydrocarbon supplier (whatever its nationality) will inevitably hamper energy supply and source diversification, as well as the development of competition and market reforms, accentuating monopolisation, especially downstream. On several occasions, Russia has exercised a combined political and energy pressure on some CIS countries. A risk is that such use of energy may amplify geopolitical imbalances and tensions in the CIS. Beyond energy, this role and influence raise additional obstacles for effective economic reforms and democratic development. It remains to be seen if the new Russian presidency, at the core of this integrated external energy strategy, will strengthen this strategy toward the EU, as anticipated, or soften it once Russian companies have consolidated their positions, notably acquiring ownership of key oil and gas transport infrastructures and gas distribution assets.

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Appendix 1: Country background notes

This appendix provides country-specific background materials for the energy-related issues in each of the CIS economies. Their main use is internal to the project, in providing the project team with information and references to sources discussing energy developments in particular CIS countries.

Armenia

by Micheil Tokmazishvili

Summary & SWOT

GDP (current USD billion)	8.0	Average annual GDP growth 2000-2007, %	12.6
Population, million	3.5	GDP per capita (USD at PPP)	4942
Total Primary Energy Supply (TPES), Mtoe	2.6	TPES/GDP, Mtoe / 000 USD, base year 2000	0.75

Notes: In this table and tables for subsequent countries TPES data refer to 2005, population, GDP, and GDP per capita data are for 2007.

Sources: IMF, WEO database (first two rows), IEA, Key World Energy Statistics 2007 (last row).

SWOT analysis: Armenia

Strengths	**Weaknesses**
Substantial hydroenergy resources Close to Iran (a large gas and oil producer) The only nuclear power plant in South Caucasus	Lack of investments for development of small and medium hydro power facilities. Ethno-political conflict with Azerbaijan Lack of mineral resources. Dependency on one source of gas and uranium imports Nuclear power plant of Chernobyl type in seismic zone
Opportunities	**Threats**
Private sector participation in construction of small hydro power facilties. Expanding of supplies and development of transit of energy from Iran Reform of the electricity sector leading to higher tariffs and making investment in the sector profitable for private companies Good political relations with Russia and improved relations between Russia and Georgia	Distraction of gas supplies from Russia through territory of Georgia due to complicated relation between Russia and Georgia Instability of Iran's gas supplies/potential transit due to complicated relations with USA Limited control on supplies/potential transit of Iranian gas (the role of Gazprom) Regional isolation of Armenia (away from strategic oil/gas pipelines passing South Caucasus) Difficult political relations with Azerbaijan and Turkey Risk of earthquakes destroying energy sector infrastructure Nuclear accident and closure of the nuclear power plant (ANNP)

Armenia has no mineral energy resources but has substantial hydropower potential. It is almost fully dependent on imported energy products – gas from Russia through Georgia and smaller volumes from Iran (also controlled by Gazprom), oil and oil products from Georgia, Iran and Russia and nuclear fuel from Russia. Over 70% of electricity demand in Armenia is satisfied through nuclear and thermal (gas) generation, which relies entirely on inputs imported from Russia. The future of nuclear power is somewhat uncertain, as the old-type nuclear power plant is located in a seismic zone and is already close to the limits of its originally designed life span.

Russian investors (especially Interenergo, a subsidiary of RAO UES, and Gazprom) play a key role in the Armenian energy sector. Progress in electricity sector reforms looks favourable compared to other CIS countries, but the reform agenda is not completed yet.

Energy production, Consumption and export/imports-key data & key players

	2000	2001	2002	2003	2004	2005	Source
Electricity Production GWh	5566.5	5744	5518	5500	6030	6316	National Statistical Service; Ministry of Energy
Small HPPs	105.3	105	104	112	149	155	
ANPP	1836.5	1987	2282	1997.6	2403	2716	
TPP	2480.1	2791	1576.4	1522	1613	1827	
HPP	1144.6	1135	1662	1981	2015	1773	
Electricity exports GWh	816	700	659	683	1012	813	
Electricity imports GWh	352	330	159	300	50	-	
Electricity consumption GWh		3872	3400	3655	3991.6	4374.4	
Natural gas production	-	-	-	-	-	-	National Statistical Service; Ministry of Energy
Imports of natural gas (bcm)		1.41	1.07	1.20	1.33	1.68	
Final consumption of natural gas (bcm)	-	0.13	0.90	0.98	1.16	1.44	
Gas exports	-	-	-	-	-	-	
Oil production	-	-	-	-	-	-	National Statistical Service; Ministry of Energy
Imports of oil products (Mtoe)		0.37	0.38	0.43	0.41	0.40	
Final consumption of fuel energy resources (Mtoe)	1.44	1.61	1.30	1.43	1.56	1.79	

Discrepancies between the sources provided by internal statistical services (National Statistical Service of the Republic of Armenia) and international organizations in electricity production are not significant. Some discrepancies between the domestic sources and data from IEA in electricity production can be explained by weakness of registration procedures in distribution and foreign trade necessitating additional estimations/assumptions. So, the main reason of differences between domestic and international sources data relates to estimations of non-registered goods. Given that Armenia is a small country of little importance for the rest of the world in terms of energy supplies, international data collected by institutions data are not necessarily systematized. Therefore, local statistic may be more reliable.

Key players

The Ministry of Energy is responsible for energy policy implementation, strategy development and privatization. Policy priority is given to improvements of energy efficiency by development of domestic renewable energy resources and energy saving systems (National Program on Energy Saving and Renewable Energy of Republic of Armenia).

Regulation of the Armenian energy sector is carried out by Public Services Regulatory Commission (PSRC), which (along with district heating, water and telecommunications), regulates electricity and gas trade, distribution and supply through licenseeing and tariffs, power purchase agreements and monitoring. It is independent within its jurisdiction.

The Government of Armenia started a reform process of the power sector through privatization in the mid-1990s, selling several small hydropower generation assets and through restructuring and unbundling the state utility Armenergo into separate companies for generation, transmission and distribution.

The key players in the Armenian electricity sector are Russian companies. A substantial part of their investments was made in 2002 in a debt-for-equity swap, where Armenia repaid its USD 97 million debt to Russia accumulated during the crisis in the1990s (Khachatrian H. 2006).

The key company is Interenergo – a subsidiary of RAO UES. The most important of its assets are: the distribution network (100%), Armenian Electricity Grids (bought in 2006 from British Midland Resources), 90% of International Power Corporation which operates the Sevan-Hrazdan chain of HPPs (about 10% of Armenian electricity market), and control over 4 blocks of Hrazdan TPP. RAO UES also has the right to manage a 100% stake in ZAO "Armenian Nuclear Power Plant" under a fiduciary arrangement.

Vanadsor Thermal plant belongs to Zakneftgassstroy-promethy.

The important player in gas sector is Armrosgazprom, the only company responsible for Russian gas imports and transport, which is 57.6% owned by Gazprom and 7.7% owned by the Russian company Itera. The remaining 34.7% is owned by the Armenian government. This ownership structure has been in effect since July 2001, when Itera acquired its share in exchange for writing off Armenia's debt for past gas deliveries. According to the agreement of March 2006 Gazprom's share is due to be raised up to 80%. Due to the same agreement, Gazprom took over the fifth block of Hrazdan TPP that is supposed to consume Iranian gas. Armrosgazprom is to become the owner of the Armenian part of the Iran-Armenia gas pipeline.

Selected facts on the energy sector

Until the Nagorno-Karabakh ethno-political conflicts in late 1980s, the electric energy system of Armenia was developed to meet the base demand of the South Caucasus Unified Energy System, and was exporting 20-25% of its electricity production. The closure of the Armenian Nuclear Power Plant (ANPP) in Medzamor after the devastating Spitak earthquake in December 1988 had a large impact on the Armenian power system. Then, the collapse of the Soviet Union, political events in the Caucasus region, a transportation blockade and problems with imports of primary energy resources (oil products, natural gas) from Russia caused a drastic reduction of gas and oil consumption and an energy crisis in the early 1990s. The power generation decreased by more than half to about 6 billion kWh.

A very severe energy shortage in the mid 1990s made the Armenian government to restart the second unit of ANPP with a total capacity of 407.5 MW, which, after some safety improvements, came back online at the end of 1995 and now provides almost one-third of Armenia's electric power. The first unit has not been and will not be restarted.

The current generation structure is not likely to change in the near future. Despite some pressure from abroad to shut down Medzamor, the Ministry of Energy is seeking external aid to maintain the safe operation of Unit 2 for another decade, which means that nuclear energy will remain one of the most important energy sources in Armenia.

At present the total installed capacity of the Armenian energy sector is about 3144 MW, of which 2420 MW is available. The installed capacity of the Thermal Power Plants (TPP) is about 1754 MW. TPPs operate on gas or fuel oil. The total installed capacity of the Hydro Power Plants (HPP) is about 1000 MW.

The main energy strategy of Armenia includes a fast development of small HPPs. "The Scheme of Small HPPs Development in Armenia" has been developed, including 325 small HPPs with a total capacity of 270 MW and an annual energy output of 770-833 million kWh. It is expected that 51 SHPPs will start operation before 2011. (Development of Small Hydro Power in Armenia).

The total value of hydro resources is estimated at 21.8 billion kWh annually. (Ministry of Energy of Armenia). The technically available potential is 7-8 billion kWh annually, and the economically justified hydro potential is around 3.6 billion kWh/year, 1.5 billion kWh of which has already been developed. The remaining hydro potential is to be developed during the next 15 years. The economically justified potential from small HPPs amounts to 800-850 million kWh/year, of which 200-220 million kWh is generated at existing units. (Energy Sector Development Strategies in the Context of Economic Development in Armenia, 2005).

In the second half of the 1990s increased hydropower generation allowed for rising electricity exports that reached some 10-15% of total generation during 2000-2005. In summer Armenia exports electricity to Iran while in winter it imports from Iran. Armenia also supplies some electricity to Georgia.

All oil products are imported to Armenia through rail or truck shipments, primarily from the Batumi (Georgia) refinery in neighbouring Georgia.

Armenia has no natural gas reserves and produces no natural gas. All the natural gas used in Armenia presently comes from Russia, through Georgia, mainly via the Kazakh-Berd-Sevan pipeline. There is also a pipeline into Armenia from Azerbaijan; however, it has been inactive since the beginning of the conflict over Nagorno-Karabakh.

There is considerable interest in a gas pipeline from Iran into Armenia, which would act to diversify Armenia's gas supply (although the Armenian part of this pipeline is owned by Armrosgazprom, in which Gazprom has a dominant position). Recently built Iran-Armenia Gas Pipeline initial capacity is 1.1 bcm of natural gas annually, which is planned to increase up to 2.3 bcm by 2019. The contract was signed for 20 years. To reach the planned amount, the Armenian side is planning to lay another 197 km of the pipeline. For each cubic meter of Iranian gas, Armenia is supposed to return 3 kWh of electric energy to Iran. The first part of the pipeline was opened in March 2007 and major construction works of Iran-Armenia gas pipeline will be completed by late 2008. There are also discussions about building a second pipeline from Iran to Armenia.

The total capacity of Armenia's gas transportation system is presently about 10 bcm per year. According to Itera's assessment, only 20 to 25% of the Armenian natural gas transportation system serving the home market is now being utilized.

The importance of the energy sector in the economy

Energy sector does not play a major macroeconomic role in the country. One exception is electricity generation, which accounts for a substantial, though declining share of total industrial production. This share declined from 28.3 percent in 2001 to 14.5 percent in 2005 (Ministry of Energy of the Republic of Armenia; National Statistical Service of the Republic of Armenia)

Currently, the energy sector of Armenia is one of the fully operational and most cost-effective branches of the country's economy. In 2002-2005 gas and fuel energy intensity (kg.o.e/1000 AMD) as well as electric intensity of GDP (kWh/1000AMD) decreased respectively from 1.7 to 1.1 and from 4.8 to 2.8. (National Program on Energy Saving and Renewable Energy of Republic of Armenia. p.11).

Key macroeconomic issues related to the energy sector

An important milestone in the promotion of small hydro development in Armenia is the preferable tariff mechanisms implemented by the PSRC. To attract more local and international investments to this field, since 2001 preferable (above average) electricity tariffs were introduced for the small hydropower plants. Since 2004 fixed tariffs have been introduced.

The second key issue concerns highly concessional terms of gas imports from Russia which, in contrast to other CIS countries, are set to prevail until 2009. According to an agreement between the Armenian government and Gazprom, natural gas price for Armenia is anticipated to be much lower than in other countries where Russia exports gas. This may have positive and negative economic consequences. Armenia is highly dependant on imported energy resources and can meet only 30-35% of the total demand for energy with its domestic resources, thus gas price stabilization will stimulate the economy and could allow preparing an arrangement to build into the economy some mechanisms for the gradual increase in the gas tariffs next years. On the other hand having a competitive advantage over the producers of other countries (in view of the low gas tariffs), Armenian government may be less motivated to continuing reforms in the energy sector and companies are not as keen on using new technologies to improve productivity, which may have a negative effect in the long run.

The role of state in the energy sector

The electricity transmission system of Armenia is operated by the state-owned firm ArmEnergo and tariffs for electricity produced in power stations are established by the PSRC. The main focus of the government in reforms is to attract investments for promoting small and medium hydro schemes.

At present, the government of Armenia owns the Yerevan Thermal power plant and Vorotan cascade. Nuclear power is a single plant that will remain state-owned. The state authority for regulation of issues of nuclear and radiation safety – Armenian Nuclear Regulatory Authority

(ANRA) – is under a direct subordination of the Armenian government and independent from organizations responsible for development and utilization of atomic energy. The ANRA is the licensing authority, organizes and performs state supervision and inspections over utilization of nuclear energy, as well as its regulation.

Other issues

Reforms of the energy sector

Over the last few years, Armenia's energy sector has passed through a difficult period of reform and reconstruction. A number of reforms have been implemented and more are ongoing in the energy sector, ensuring the operation of an efficient and uninterrupted energy supply. Reforms include the formulation of market relations, the development of legislation and tariff policy regulation, and the implementation of privatization procedures. As a result of power sector restructuring, five power generation plants and transmission and distribution systems have been separated. Dispatching and settlement centres have also been established.

In order to secure sustainable development of Armenia, priority is given to the development of domestic hydroenergy resources and widespread implementation of energy efficiency throughout the economy. But insufficient investments, legal barriers (hampering solving of conflicts with landowners in the process of construction of small hydro plants) as well as procedural and technical barriers – vagueness of procedures, especially with respect to land allocation, water use and environmental impact assessment etc., hampers hydroenergy resources utilization and constriction of new plants. (Development of small hydro schemes in Armenia). A detailed account of electricity sector reform in Armenia can be found in Sargasyan et al (2006).

The future of the Armenian nuclear power station

The Armenian nuclear power plant was built in 1977-1980 with a designed lifespan of 30 years. Armenian and Russian officials believe that the reactor could be operated until 2016. However, the EU has been pressing Armenia to shut the plant down because of its inherently unsafe design that cannot meet EU nuclear safety standards, as well as the region's continual risk of earthquakes. In the meantime, additional safety improvements are being installed at the plant with technical and financial assistance of the US and the EU. The government of Armenia has made a commitment to its citizens and to the European Commission that the ANPP will eventually close. This will necessitate the provision of adequate replacement power. In particular, according to expert estimation, if the capacity and generation of the ANPP are replaced by thermal generation, 60% of the country's electricity consumption will be generated using mainly imported natural gas. (Energy Sector Development Strategies in the Context of Economic Development in Armenia. 6-2). This will bring new ecological and social challenges stemming from an increase of greenhouse gas emissions and of payments to foreign suppliers of gas, as well as tariff increases.

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http://www.aeplac.eu/AT/statistics.asp - Armenian European Policy and Legal Advise Centre.

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Azerbaijan

by Sabit Bagirov

Summary & SWOT

GDP (current USD billion)	31.3	Average annual GDP growth 2000-2007, %	15.9
Population, million	8.6	GDP per capita (USD at PPP)	7656
Total Primary Energy Supply (TPES), Mtoe	13.8	TPES/GDP, Mtoe / 000 USD, base year 2000	1.40

SWOT Analysis: Azerbaijan

Strengths	**Weaknesses**
Substantial oil and gas reserves Common border with countries that possess considerable energy reserves: Russia, Iran, Kazakhstan and Turkmenistan Location as a transit country Availability of regional oil and gas pipelines – access to European and global markets Established electricity network Established gas transmission network Availability of refining capacity	Physical obsolescence of electricity and gas transmission networks Limited oil and gas storage A weak legislative and regulatory framework Domestic resources not sufficient to fill existing pipelines during their lifespan
Opportunities	**Threats**
Increased production of domestic resources (oil and gas) Expanded transit activities and increased transit revenues Private sector participation Increasing volumes of Central Asian gas transit	Pressures on fiscal revenue streams as a result of explicit and implicit subsidies Lack of new energy resource discoveries – possible turn from exporting energy resources into importing them (in 25-30 years) Proximity to conflict zones and terrorist threats The unresolved status of Caspian Sea borders with Iran and Turkmenistan Dutch disease

Azerbaijan is enjoying a major oil boom, with output more than doubling between 2004 and 2007 and net exports more than tripling in the same period. This made Azerbaijan the largest contributor to total non-OPEC output growth during 2006-2007. This output surge is expected to last until around 2010, and unless new reserves are discovered after 2015, oil production is expected to decline. The recent increase in oil output comes mainly from the offshore Azer-Chiraq-Gunashli (ACG) oil deposit developed by the international consortium AIOC, with a leading role played by BP. The large majority of exports is conducted via the Baku-Tbilisi-Ceyhan (BTC) pipeline, bypassing Russia and the Bosporus and Dardanelles Straits. Small quantities are also exported via the Baku-Novorossiysk and Baku-Supsa pipelines.

Gas production has been generally flat in recent years and Azerbaijan has been a net importer of gas due to buoyant domestic consumption. The major increases in production are expected to be starting in 2008 from the very large offshore Shah Deniz field operated by an international consortium led by BP. Gas from the Shah Deniz field will be mainly exported via the Baku-Tbilisi-Erzurum pipeline, running parallel to the BTC. Azerbaijani gas is currently reaching Georgia and Turkey.

Several foreign investors are present in the Azeri oil and gas market and production sharing agreements (PSA) are the dominant mode of operation. The state energy company SOCAR plays an important role.

The energy sector dominates the economy and played a key role in the recent economic boom (with annual GDP growth averaging around 17% since 1999 and exceeding 30% in 2006 and 2007). Oil accounts for well over 80% of Azeri exports. The fiscal response to the boom is generally considered less than prudent, with insufficient savings.

Energy production, consumption and exports / imports – key data & key players

	1990	1995	2000	2006	Source
Oil production (Mt)	12.5	9.2	14.0	32.5	BP (2007)
Oil production (Mt)	12.5	9.2	14.0	32.3	Statistical Yearbook of Azerbaijan. State Statistical Committee
Domestic oil consumption	8.5	6.6	6.3	4.7	BP (2007)
Oil exports (Mt)	0	0	5.5[117]	23.4[118]	State Committee and SOCAR
Gas production (bcm)	9.2	6.2	5.3	6.3	BP (2007)
Gas production (bcm)	9.9	6.6	5.6	6.8	Statistical Yearbook of Azerbaijan. State Statistical Committee
Domestic gas consumption	15.8	8.0	5.4	9.6	BP (2007)
Domestic gas consumption	16.9	8.1	5.5		Statistical Yearbook of Azerbaijan. State Statistical Committee
Gas exports (million cubic meters)	5.4	0	0	65.5	Statistical Yearbook of Azerbaijan. State Statistical Committee
Gas imports (bcm)	13.4	0.6	0.3	4.4	Statistical Yearbook of Azerbaijan. State Statistical Committee

Key players in the energy sector

Oil and gas extraction and export:

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117 Independent Azerbaijan. 10 years. 2001. State Statistical Committee of Azerbaijan Republic, page 609

118 http://www.socarmo.az/ex_crude_BTC.shtml

- State Oil Company of the Azerbaijan Republic (SOCAR). The company is state-owned and is under the control of the country's president;
- BP and other foreign oil companies (Statoil, ExxonMobil, TotalFinaElf, Lukoil, Itochu and others) that are contractors in PSAs signed by the government;

Oil and gas processing:

- State Oil Company of the Azerbaijan Republic (SOCAR);

The sale of oil products on the domestic market:

- State Oil Company of the Azerbaijan Republic (SOCAR);
- Azpetrol (private company);
- ABU Petrol (private company);
- Lukoil;

Power generation and distribution:

- Azerenergy JSC – a state-owned producer and distributor of electricity;

Natural gas distribution:

- Azerigas JSC – a state-owned gas distributing company.

Selected facts of the energy sector

The proved oil reserves (one billion tonnes at the end of 2006) and gas reserves (1.35 trillion cubc meters at the end of 2006) will make it possible to provide the country with its domestic energy resources in the next 25 years. The main proved oil reserves are concentrated in the Azeri-Chiraq-Guneshli offshore deposit. The main proved gas reserves are concentrated in the Shah Deniz offshore deposit. Both deposits are operated by consortia of foreign oil companies on the basis of PSAs signed by the government.

The volume of oil exports in two years will reach a peak of 55-60 Mt per year. After that, the volume of export will start to fall gradually and will probably decline to just several Mt per year by 2030.

Until recently, Azerbaijan was a net gas importer (buying gas from Russia). The volume of gas extraction will grow in the next few years and will probably reach 15-20 bcm by the middle of the next decade. By the middle of the next decade, the volume of exports will hardly exceed 10 bcm since some of the gas will be used for local consumption. Natural gas reserves make it possible to increase the volume of expected extraction and exports; however, this will require additional investments in the project on the development of the Shah Deniz deposit.

Oil is exported mainly by the Baku-Tbilisi-Ceyhan (Turkey), Baku-Supsa (Georgia) and Baku-Novorossiysk (Russia) pipelines. BTC, opened in May 2006, has a capacity that is more than 3 times larger then these of the two others. Part of the crude oil is exported by the Baku-Batumi (Georgia) railway. Gas is exported by the Baku-Tbilisi-Erzurum (Turkey) gas pipeline.

The transit of oil and oil products from Central Asia is carried out mainly by railway. The volume of transit tends to grow (especially when terminal in Kulevi is finished this November). It is expected that Kazakh oil from the Kashagan and probably Tengiz deposits will start being exported by the BTC pipeline in the next few years.

Negotiations on the trans-Caspian pipelines are continuing: on the oil pipeline from Kazakhstan and the gas pipeline from Turkmenistan. It is planned to lay the pipelines on the Caspian seabed. The Azerbaijani government recently received a grant from the US government to draft projects on these pipelines. Still – due to many unresolved problems, e.g. related to the legal status of the borders in the Caspian Sea – it is hard to say if and when these pipelines could be realized.

The volume of power generation reached 23.8 billion kWh in 2006, 88% of which was generated at thermal and 12% at hydroelectric power plants. The construction of new power plants and the reconstruction and updating of the infrastructure has intensified in recent years. Four regional power plants with an overall capacity of 348 MW were put into operation in 2006. However, a lot still remains to be done to develop generating capacity and power networks. The government is also attempting to restructure the sector, including handing over the management of regional and urban power networks to private companies.

The gas distribution infrastructure requires serious reconstruction and expansion. A number of regions are experiencing a chronic shortage of gas. Some regions have not yet been covered by a distribution system of branching gas pipelines.

The importance of the energy sector in the economy

The oil and gas sector is the leading sphere of the economy. The share of this sector in GDP is 54%. More than 60% (forecast for 2007) of budget revenues are coming from the oil sector (51.4% in 2005 and 58.4% in 2006).

Key macroeconomic issues related to the energy sector

The growing volume of oil extraction and high world oil prices in the world will bring considerable oil revenues to the country in the next two decades. It is projected that cumulative revenues from the development of the ACG deposit alone will total USD 250 billion by 2025 if one barrel of oil costs USD 70. In order to prevent Dutch disease, the government set up the Oil Fund at the end of 1999, which accumulates most of the revenues today (more than 90%). Calculations show that in the period from 2008 to 2017, the country's annual revenues will exceed USD 10 billion. In early August 2007, the Oil Fund already had USD 2 billion. All in all, the Oil Fund has received approximately USD 4.2 billion since it was set up (more than half of this sum has already been spent on transfers into the budget, on a number of investment projects, on financing the SOCAR share in the BTC oil pipeline project and on the improvement of the financial situation of refugees – victims of the Karabakh war). Trying to speed up the settlement of numerous problems that have accumulated in the country, the government has sharply increased state spending in recent years thanks to oil revenues. Over the last two years, state budget spending has increased by 60% (42% in 2005 and 77% in 2006). This has already increased inflation, which reached 16.5% in the first quarter of 2007. The strengthening of the national currency – the manat – against the dollar also has a negative impact on the competitiveness of the non-oil sector.

The role of the state in the energy sector

The state plays a leading role in the energy sector. The position and role of the private sector are strictly regulated by the state.

Foreign oil companies that are contractors in PSA agreements (each of them is ratified by the country's parliament and becomes a law) are playing a more and more important role in the oil and gas extraction sector. However, this role will decrease (as extraction at ACG and Shah Deniz falls) if, first, no new oil and gas reserves are discovered, and second, if the state decides not to use foreign capital to develop these reserves. The latter is quite possible because the country will soon have quite significant financial resources as a result of the development of ACG and Shah Deniz. The financial possibilities of SOCAR are also growing. SOCAR recently purchased a terminal in Kulevi and plans to build an oil refinery in Ceyhan. An attempt was also made to buy the Turkish petrochemical company Petkim.

The State Oil Company (SOCAR) is the driving force of the local economy, and the government has not yet announced plans to privatize it.

In the power generating and distributing sector, the state also plays an important role and owns 100% of the shares of the Azerenergy company. By the end of 2006, several power-distributing networks of Azerbaijan (for example, Baku, Sumqayit and a number of northern, western and southern districts of the country) were run by the private companies Barmek and Bayva. However, conflicts with the population and government led to the termination of contracts with these companies and to the return of the management of relevant networks to Azerenergy. A number of state-owned companies also have small generating facilities, but these facilities are used mainly by these companies themselves.

The state also owns 100% of the shares of the gas distributing company Azerigas. The company fully controls the domestic market of natural gas which it buys from SOCAR and a number of private companies set up jointly with SOCAR.

Energy prices on the domestic market are regulated by the state through the Tariff Council, which in fact is not an independent regulator because only government agencies are represented in it.

The PSAs signed by the government contain some restrictions on the export of hydrocarbon reserves by foreign contractors. The state has the right to buy part of the production that belongs to contractors.

Other issues

The growth in the extraction and export of hydrocarbon reserves from Azerbaijani deposits, as well as the expected oil and gas transit from Kazakhstan and Turkmenistan to European countries via Azerbaijan is turning this South Caucasus country into an important link to European energy security. As a supplier of its own energy reserves to the European market and as a transit country to transport Central Asian hydrocarbon reserves to Europe, Azerbaijan will be playing an important role in the diversification of energy sources for the EU in the next few decades. It should be seen in this light that in November 2006, Azerbaijan signed the European Energy Charter Treaty.

Azerbaijan has a number of promising oil and gas deposits in the Caspian Sea. However, exploratory work is being delayed as the issue of the status of sections of the Caspian Sea bordering on Turkmenistan and Iran has not been resolved yet.

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Belarus

by Elena Rakova

Summary & SWOT

GDP (current USD billion)	44.8	Average annual GDP growth 2000-2007, %	7.2
Population, million	9.6	GDP per capita (USD at PPP)	10910
Total Primary Energy Supply (TPES), Mtoe	26.6	TPES/GDP, Mtoe / 000 USD, base year 2000	1.46

SWOT analysis: Belarus

Strengths	**Weaknesses**
Location as a transit country Geographical proximity to its primary energy supplier Extensive wood resources Established electricity network Established gas transmission network Export refining capacity and established oil transit network	Limited indigenous energy resources High dependence on imported energy Very heavy dependence on Russia as a supplier of primary energy Ageing physical infrastructure Limited oil and gas storage A weak legislative and regulatory framework Limited commercial focus Limited investment possibilities of energy enterprises
Opportunities	**Threats**
Increased production of domestic resources (primarily wood) Diversification of energy supply sources Expanded transit activities and increased transit revenues Increased security of domestic supply as a result of expanded storage facilities Private sector participation Increased energy efficiency (energy saving)	Disruption in energy supplies from Russia (particularly gas) Higher energy import costs Deterioration in service quality Further deterioration of the domestic infrastructure Pressures on fiscal revenue streams as a result of explicit and implicit subsidies

Source: Word Bank (2006), Belarus: Addressing Challenges Facing The Energy Sector, with minor modifications.

Belarus does not produce any substantial amounts of hydrocarbons and is strongly reliant on imports, primarily from Russia. At the same time it is an important transit country for Russian gas and oil sales to Europe (with around 20% and 30% shares, respectively).

Gas is the primary input for electricity production and Belarus is a very large consumer of this commodity, significantly larger than Poland, for example. Up to the end of 2006, Russian gas imports were priced at a fraction of levels paid by other European countries. The doubling of prices in 2007 and agreed further increases are expected to strongly impact on domestic electricity and heating prices, with potentially significant consequences for households and business. For several years, Gazprom has been interested in taking control of the gas transportation company JSC Beltransgaz, and import price deals have been linked to the privatisation of this company. The end-2006 deal foresees a gradual transfer of a 50% stake in JSC Beltransgaz to Gazprom during 2007-2011. Gazprom has built and currently controls the Yamal gas pipeline to Poland and Germany.

The oil sector plays an important role in the Belarusian economy and the country's two large refineries (one state-owned, the other with the participation of a Russian investor) produce substantial volumes of oil products, which account for up to 40% of total exports to non-CIS countries. Oil refining was very profitable (and brought substantial tax revenues to the Belarus budget) until end-2006 as Belarusian companies were importing Russian crude without Russian export duties and were then able to sell oil products at European prices.

Energy production, consumption and exports / imports – key data & key players

	1990	1995	1996	2000	2005	2006	Source
Oil and oil products							
Oil production, Mt	2.05	1.93	1.86	1.85	1.79	1.78	Ministry of statistics
Oil imports, Mt	-	11.0	11.0	11.9	19.2	20.9	Ministry of statistics
Oil exports, Mt	-	-	-	0.3506	1.3456	1.1384	Ministry of statistics
Oil refining production, Mt	39.44	13.12	12.37	13.5	19.8	21.3	Ministry of statistics
Oil refining exports, Mt	-	-	3.71	7.78	13.48	14.8	Ministry of statistics
Oil refining imports, Mt	-	-	0.46	1.06	0.55	1.2	Ministry of statistics
Domestic oil consumption, Mt	-	-	9.8	7.0	6.7	8.0	BP
Domestic oil consumption, Mt	-	12.93	12.86	13.4	19.64	21.54	Ministry of statistics
Oil products consumption, Mt	-	-	9.12	6.78	6.87	7.7	Ministry of statistics
Gas							
Gas imports, bcm		13.5	14.3	17.12	20.12	20.8	Ministry of statistics
Domestic gas consumption, bcm	-	-	13.0	16.2	18.9	19.6	BP
Domestic gas consumption, bcm	-	-	-	16.0	20.12	20.8	Ministry of statistics
Gas transit, bcm	-	21	21	26	39.3	44.2	Ministry of energy
Yamal-Europe					27.0	31.0	
Beltransgaz		21	21	26	12.3	13	
Electricity							
Electricity generation, Terawatt-hours (TWh)	-	-	23.7	26.1	27.3	28.0	BP
Electricity generation, TWh	39.5	24.9	23.7	26.1	31	31.8	Ministry of

							statistics
Electricity import, TWh	14.2	10.1	11.2	10.0	9.1	5.5	Ministry of statistics
Electricity consumption, TWh	49.0	32.1	32.3	33.3	35.0	36.2	Ministry of statistics
Electricity exports, TWh	4.7	2.9	2.6	2.8	5.1	1.1	Ministry of statistics
Production of primary energy resources, million toe	5.4	4.9	4.9	5.0	5.3	-	Ministry of statistics

Source: BP Statistical Review of World Energy June 2007, www.bp.com; Statistical yearbook of the Republic of Belarus, 2006 (Statistical yearbook), the Ministry of statistics of the Republic of Belarus; IPM Research center, *Belarus Infrastructure monitoring*, 2004-2007, http://research.by/eng/bim/

Note: 1) Belarus became independent in 1992. 2) The Yamal-Europe gas pipeline opened in 2002.

In general, the numbers on energy production, and imports and exports of energy from Belarussian and international sources do not contradict each other. However, some notes are worth making. For example, the BP data on domestic oil consumption indicate the consumption of oil products in Belarus; while the Ministry of Statistics first accounts primary oil consumption (mainly by refineries, which later export oil products) and then consumption of refined products.

In addition, BP's numbers on domestic electricity generation deviate from those of the Ministry – BP data are almost 10% lower over the last two years. It is difficult to speculate on the source of this difference. One would think the national statistics should offer more precise numbers.

Key players in the energy sector

The natural gas sector in Belarus is dominated by the state owned enterprise Beltopgaz, managed and controlled by the Ministry of Energy of Belarus, and JSC Beltransgaz (Gazprom has a stake here). While Beltransgaz is responsible for natural gas transportation to Belarus and for managing natural gas transit, Beltopgaz deals with the distribution and retail sales of natural gas to final consumers inside Belarus.

The Belarusian power system (state enterprise Belenergo) consists of six independent regional companies (one for each oblast – oblenergos).

There is also a developed oil sector with transit and refinery capacity. 70% of all oil transit is done by a state enterprise named "Gomeltransneft Druzhba", that has a 1923 km pipeline to Poland, Ukraine and Germany. The rest is done by state enterprise "Novopolozk Druzhba" that has a 1065 km pipeline to the Baltic countries. There are two refining plants in Belarus – Mozyr refinery in the Gomel region (JSC, Russian oil company Gazpromneft (Slavneft) owns 42%, with 16 Mt of oil refining capacity) and Naftan refinery in Novopolozk (JSC with 100% state ownership, with 24 Mt of annual refining capacity).

Selected facts on the energy sector

Importance of gas and Russian-Belarusian gas prices negotiations

Gas is a critical input for the Belarusian economy. It is used mainly for power and heat generation (58% of the total gas consumption) and industry (29%). Imported gas prices have been historically very low leading producers to increase reliance on it. The share of gas in the energy balance of Belarus increased from 43% in 1990 to 80% at the present time. Since 2000, Belarus has been gradually increasing the consumption of gas, which amounted to 21 bcm in 2006.

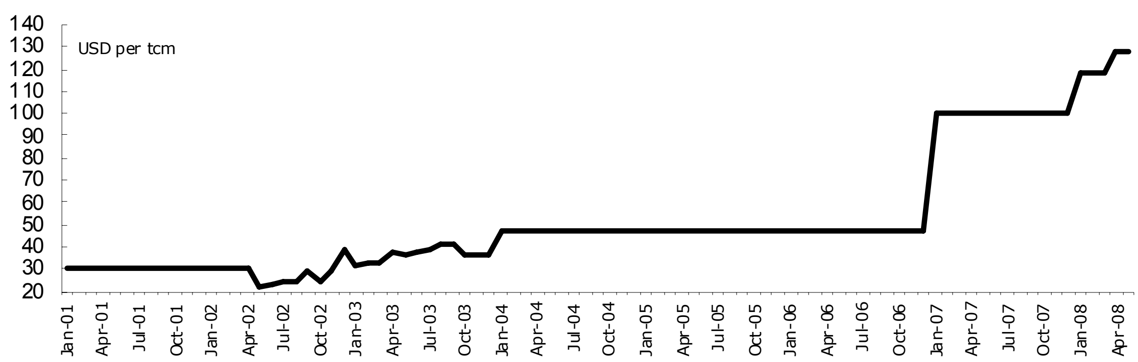
Ninety-five percent of Belenergo power generators work on gas, which makes it a critically important component of domestic power production. Gas is also a critical component for the industrial sector in Belarus. The biggest industrial gas consumers are chemical and oil enterprises – GrodnoAzot, MogilevHimvolokno, Naftan, and Mozyr. All of these plants are among the biggest taxpayers and exporters, and for most of them shortage of gas would mean shutting down the closed production circle and bearing significant losses to recover the production. Besides economic consequences, the lack of gas is a threat to political stability in the country - 90 cities out of 104, and 57 small towns out of 110 are heated by burning gas.

Gas consumption in Belarus is increasingly exposed to price risks since Belarus exclusively relies on Russian gas. Until 2002, Belarus bought gas from Russia at prices, which were the equivalent to USD 40-50 per tcm. In April 2002 Belarus and Russia signed the intergovernmental agreement “On single price policy”, which led to a decrease of gas prices for Belarus (the price was set at the internal Russian level, however, only for a volume of 10 bcm per year). The Russians considered the second agreement “On establishing a joint venture on a Beltransgaz basis” to be in tandem with the first, in contrast with the Belarusians, who then delayed negotiations on Beltransgaz privatisation arguing for a higher market value estimation.

The failures to set up this joint venture hampered the relationship between the two countries. For example, in 2004 for the first time in five years, the two countries did not sign a common energy agreement and on February 18 Gazprom altogether stopped the gas supply to Belarus, including transit gas to Europe, since Belarus had started unauthorized gas usage. The contract on gas supply for 2004 was signed only in July. According to this contract, the real price was higher than in 2004 (18% VAT was added).

Since 2005, Gazprom is an exclusive deliverer of Russian gas to Belarus. For a long time the gas price for Belarus is the lowest among CIS countries. Only in 2007 the situation changed and quite abruptly so, with prices doubling (Figure A.B.1) and sides agreed on a gradual further price increase (in 2008 up to 67% of the European price minus transportation costs) in order to have market prices by 2011. Besides, in 2007 Gazprom bought 12.5% of Beltransgaz shares. According to the contract (signed in 2006), Belarus would sell 50% of Beltransgaz shares for USD 2.5 billion (in annual tranches of 12.5% annually for USD 625 million each). For more information on the conditions of this contract, see IPM Research center publications.

Figure A.B.1. Dynamics of prices for gas imported by Belarus, 2001 – early 2008



Note: Import price without VAT.

Source: Ministry of Statistics and Analysis.

The structure of the gas sector and principles of its functioning

Transit of Russian gas across Belarus is much lower than across Ukraine. However, in recent years Belarus gradually increases its transit capacities. In 2006, Belarus transited 44.2 bcm of Russian gas. Seventy percent of all transit is done via the Russian pipeline "Yamal-Europe" (and the share of this pipeline in the total amount of transit is increasing). The rest is covered by Beltrangaz, which has lower transit fees.

The Beltransgaz network is used to supply gas to the Baltic States and the Kaliningrad region (oblast), while Yamal-Europe is used to supply Poland and Germany. After completion of the Nord Stream gas pipeline, the dependence of Gazprom on Belarus in supplying natural gas to the Kaliningrad region and the Baltic States is likely to reduce. Nevertheless, Gazprom was interested in setting up a joint venture with Beltransgaz, although both sides for a long time could not agree on the Beltransgaz market price.

Price formation on all stages relies on the "cost plus" approach. Beltransgaz used to add 20-25% to the initial import price of gas. Beltopgaz would add another 20-25%. However, after the recent price increase for imported gas, mark-ups of both gas enterprises were considerably reduced. The Ministry of Economy must approve initial prices (declarations) by a special document. The final price could be less than demanded. Gas prices vary not just based on the category of consumers (population, industry etc.) but also inside categories of final consumers due to granted privileges and exceptions. Though in most cases revenues cover costs, some groups of consumers are cross-subsidized. For instance, Calor (condensed) gas for the population is subsidized. Agricultural and some industrial enterprises also buy gas at lower prices based on the principle of the political expediency of such state support. The revenues from industrial clients cover the resulting losses.

Prices and tariffs for domestic consumers were set by the Ministry of Economy (since October 2003 – by the Council of Ministers) and not by the Ministry of Energy. Thus, the procedure of price setting is separated from economic activity. However, the prices include transportation and distribution costs, which are not explicitly set. The Ministry of Economy plays some functions of a regulator, setting prices using a "cost plus" approach. However, in the absence of a truly independent regulator in the sector, it is doubtful if under such regulatory framework the companies have enough incentives to lower costs.

Since 2005, trying to keep prices for imported gas at the lowest level in the energy disputes with Gazprom, Belarus paid back all external debts for the previous year's consumption and pays on time for the current consumption. Tightening payment discipline inside the country allowed eliminating non-cash payments and reducing internal debts. Meanwhile, in 2007, after doubling prices for imported gas and the increases in domestic prices for gas and electricity, internal indebtedness started to grow again.

In 2005-2006 industrial consumers paid USD 72-75 per tcm, in 2007 – USD 140-150 per 1 tcm of gas. However, some preferential prices at a level of about 50-80% of the official price are kept for some selected enterprises (Belenergo, some state plants of chemistry, peat, light, porcelain and other industries).

Natural gas tariffs for households were fixed at the level USD 94 in 2006 (USD 105 in 2007) per tcm. The cost recovery for all natural gas consumed by households by the end of 2006 amounted to 96% (70% for liquefied (condensed) gas used by households in rural areas and 115% for natural gas).

Electricity sector system

The main source for Belenergo's generation of 98% of electricity and 60% of heat is gas. Such high dependence on gas (around 70% in the fuel balance) creates numerous risks on economic and energy security of the country. For a number of years Belarus has been importing 30% of consumed electricity.

Since 2005, the payment discipline has remained strict; non-money schemes have been almost liquidated (representing 2.1% only). Nevertheless, the situation regarding payments within the country remained difficult as arrears of the final consumers to Belenergo still exist. Overdue debts for electricity represented 56.2% of all overdue debts for fuel resources. The main debtors of Belenergo are the companies of the Ministry of Agriculture.

Tariffs for electricity are rather high for industrial consumers. In 2006 tariffs for electricity for industrial consumers amounted US cents 7.78 per kWh. In 2007, tariffs were increased and since July 1, 2007 amounted US cents 10.3 per kWh, the highest in CIS and on a par with several European countries. Among the main reasons of such high tariffs is the policy of cross-subsidization (low tariffs for households and agriculture enterprises by high tariffs for industries and relatively low tariffs for heating by higher tariffs for electricity). Such price policy distorts financial flows and creates an additional burden for Belenergo. Among other reasons one can point out the low efficiency of the energy enterprises and lack of restructuring and reforms inside the energy sector.

Electricity tariffs for households amounted to US cents 5 per kWh in 2007. They covered 93% of costs by the end of 2006, which is the same as in the previous year. The ratio of household tariff to industrial electricity tariff has been gradually decreasing, down to 0.48 in 2007. The relation is reversed compared to EU practice.

Oil sector

Belarus transported 78.8 Mt of oil to Europe in 2006, a 10% decrease from 2005. The main reason for this is diversification of oil transit flows by Russia. According to forecasts, Belarus would transit 70.4 Mt in 2007. In February 2007 the tariff on transit of Russian oil through Belarusian territory was increased to the Russian level – from USD 0.41 per tonne per 100 km to USD 0.6.

Refining plays an essential role in the country's trade balance – more than 40% of all exports to non-CIS countries consist of oil products. Belarus increased its imports of crude oil from 11 Mt in 1995 to 13 Mt in 2000, 17.8 Mt in 2004 and around 21.5 Mt in 2007.

The possibility to buy cheap Russian oil (without export duty), to refine it and sell Belarusian oil products at world prices provided high profits for suppliers of Russian oil (private Russian and Belarusian companies), for Belarusian refining plants and for the Belarusian government (because of export duties on oil products). The Russian budget has not benefited from this scheme. The Russian side initiated negotiations, which led to a short interruption in oil transit through "Druzhba" (in early 2007).

Since January 1, 2007 Russia imposed a duty on its crude oil supplied to Belarus (at the level of 29.3% of the duty established in Russia; by 2009 it would be 35.6% of the duty established in Russia). Besides, Belarus has assumed the obligation to collect duties from exports of oil products at the level currently prevailing in Russia.

Revenues from high duties are added to the state budget. Meanwhile, the new duty policy damages the economic state of the refineries. Despite the subsidies to every oil supplier, which amounted to 90% of the duty paid to the Russian budget, profitability of refining will decline dramatically in 2007. During the first 6 months of 2007, the Mozyr refinery made a USD 3.8 million profit, Naftan, which has lower transport costs – 26 million. For comparison, for 6 months of 2006 Mozyr made a USD 120 million profit. Both refineries have ambitious investment plans and up to now it is unclear how they would be financed under the current price conditions.

Energy security and diversification

At the governmental meeting taken place on December 1, 2006, President A. Lukashenko approved the suggestions of the National Academy of Science and of the government on building a nuclear power station in the country. It would be built in the Chauss region of Mogilev oblast. According to the concept of national energy security, the first energy block should already start working in 2013. According to the plans of the government, start-up of two blocks of the nuclear power station with a total capacity of 2000 MW would allow Belarus to substitute around 5 bcm of natural gas. However, some scientists and experts have expressed doubts on the economic efficiency and feasibility of such a project.

Besides, according to the Concept of energy security until 2020, Belarus would build three coal power stations and shift some energy consuming enterprises to coal (for example cement plants). Nowadays gas constitutes 80% of the Belarusian fuel balance and there are plans to reduce its share to 50% by 2020. Local fuels (peat, wood) used in power and heat generation are supposed to reach 30%. The government aims to reduce energy intensity by 31% in 2010 and by 60% in 2020.

The importance of the energy sector in the economy

The energy sector itself plays a minor role in employment: there are 41,000 people employed in the power sector, 16,000 – in the gas and oil sectors (on a total of 3.5 m people employed).

The electricity sector receives only 4% of all fixed capital investments. The share of energy sector investment in GDP is minor as well (see table).

Table A.B.1 The role of the energy sector

	2004	2005	2006
Investments, USD million (WB)	431	522	na
Investments in GDP, % (WB)	1.9	1.8	na

Source: Word Bank (2006), Belarus: Addressing Challenges Facing The Energy Sector, http://siteresources.worldbank.org/BELARUSEXTN/Resources/BelarusEnergyReview_July2006-full.pdf

The share of the energy sector in GDP amounted to around 8% in recent years (see table).

Table A.B.2 Share of the energy sector (electricity and fuel industry) in GDP, %

1990	1995	2000	2001	2002	2003	2004	2005	2006
2.7	5.0	6.2	6.0	5.8	6.3	7.3	8.1	7.9

Source: own calculations based on Statistical yearbook of the Republic of Belarus, 2006 (Statistical yearbook), the Ministry of statistics of the Republic of Belarus.

In, 2006 transit revenues amounted to USD 235.5 million, of which the budget received USD 51.8 million. In 2007, the transit revenue is projected to be USD 394 million, in 2008-2010 – USD 402 million per year. Revenues from transit take a significant share of exports of services (around 13.3% in 2006). Additionally, in 2005–2006 the transit sector attracted a significant share of gross FDI (see table A.B.3).

Table A.B.3 The role of transit sector in gross FDI inflow, USD million

	2003	2004	2005	2006
Gross FDI inflow	754.5	897.8	688.8	998.7
Gazprom investment in Yamal-Europe pipeline	38.1	26.3	234.5	243.1
Share (% of gross FDI)	5.0	2.9	34.0	24.3

Source: NBB, the Balance of payments, http://www.nbrb.by/statistics/sref.asp

The oil sector plays the most important role, which amounts to around 20% of industrial production (Table A.B.4). Oil refining and export of oil products are the most beneficial and profitable for the budget and for the trade balance as well. Revenues from oil transit amounted to USD 180 million, the payments to the state budget – USD 44 million. According to government plans, oil transit revenues would amount USD 196 million in 2007, payments to the state budget – USD 52 million.

Table A.B.4 The role of the fuel industry in the economy

	2001	2002	2003	2004	2005	2006
The share of the fuel industry in industrial production, %	14.9	15.8	16.7	18.9	21.7	21.9
Contribution of the fuel industry to industrial output growth, %-points	0.9	2.1	1.4	3.7	1.8	4.6
The share of mineral products in exports of goods, %	18.2	20.9	22.7	27.4	35.4	38.8
Growth rate of exports of mineral products, % yoy	-8.8	24.2	34.3	67.5	49.5	35.6
Growth rate of exports of other goods, % yoy	4.3	4.0	21.3	30.0	3.3	16.9

Source: the Ministry of Statistics and Analysis, NBB.

Budget revenues from oil business amounted (according to different estimates) to USD 2-3 billion annually (including direct and indirect revenues). In 2007, these revenues increased, while profits of the oil refineries decreased significantly. Over the first half of 2007, the increase of revenues from oil product custom duties amounted to 1/3 of the increase of budget revenues and reached about USD 1 billion (about USD 200 million for the whole 2006). But taking into account the poor current financial state of the refineries, the government faces a dilemma: to either keep all additional revenues from increased export duties in the budget or to transfer them to the oil suppliers and the refineries, so that the former can supply oil and the latter can refine and realize ambitious investment plans.

Energy companies are a significant source for the Belarusian budget. For example, in 2006 Naftan refinery supplied 4.7% of all consolidated budget revenues (in 2004 – 3.5%); Mozyr refinery – 3.5% (3.8% in 2004); Beltransgaz – 1.7% (Table A.B.5). Gas and electricity companies together supply 20% of all budget revenues (all taxes, including VAT). According to some estimates, budget revenues from the oil business amounted to approximately USD 3 billion. These revenues have helped the government to boost population income and subsidize enterprises without implementing any serious economy-wide or sectoral reforms.

Table A.B.5 Top-20 taxpayers in the first half of 2006

Rank	Company	Activity	% of	
			Consolidated revenues	GDP
1	Naftan	oil refinery	4.69	2.36
2	Mozyrskiy NPZ	oil refinery	3.52	1.77
3	Yunivest-M	oil trader	2.04	1.02
4	Beltransgaz	gas transit	1.72	0.86
5	Minskenergo	energy (Minsk and Minsk oblast)	1.31	0.66
6	Belorusneft	oil trader	1.21	0.61
7	Lukoil-Belorussia	oil trader	1.00	0.50
8	Vitebskenergo	energy (Vitebsk oblast)	0.89	0.45
9	Gomelenergo	energy (Gomel oblast)	0.80	0.40
10	Minsk Kristall	alcohol	0.76	0.38
11	Slavneft-Start	oil trader	0.73	0.37
12	Belorusskiy metallur-gicheskiy zavod	ferrous metallurgy	0.72	0.36
13	Belaruskali	potash fertilizers	0.55	0.28
14	Mobilnaya tsifrovaya sviaz	telecommunications (GSM)	0.54	0.27
15	Grodnoenergo	energy (Grodno oblast)	0.47	0.23
16	Mogilevenergo	energy (Mogilev oblast)	0.46	0.23
17	Slavneftekhim	oil trader	0.44	0.22
18	Minskiy traktorny zavod	Tractors	0.38	0.19
19	Brestskiy LVZ “Belalco”	Alcohol	0.37	0.19
20	Brestenergo	energy (Brest oblast)	0.35	0.18
Sub-total for oil companies			13.62	6.85
Total			22.95	11.53

Source: own calculations based on http://www.gazetaby.com/index.php?sn_nid=8898&sn_cat=34

Key macroeconomic issues related to the energy sector

Preferential terms of energy gas and oil supply from Russia played a substantial role in the strong economic growth recorded in Belarus over the last few years. To illustrate, in 2006, if Belarus were to pay the German price for the volume of gas imported (USD 250/tcm for 21 bcm which was imported) it would have to spend an additional 19% of GDP, while the Ukrainian price (USD 95 per tcm) would only take an extra 3% of Belarus’ GDP.

In 2007, the price conditions of gas and oil trade with Russia considerably changed. This amounted to a major terms of trade shock to Belarus. As a result, a number of important macroeconomic issues and challenges are related to the energy sector, which are relevant to Belarus, Russia and the EU. A further increase in gas prices would reduce GDP growth and hamper national competitiveness (through higher energy prices and costs), first of all in export industries to Russia (chemistry, machinery etc.) and on domestic markets. Lower revenues from oil refining exports and rising imports of consumer and investment goods would increase the negative trade balance.

An increasing dependency of the Belarusian economy on external market conditions, mainly energy prices, also challenges future development. Belarusian exports are largely concentrated in oil products, chemicals, and petrochemicals (jointly amounting to 50% of the total volume of exports). Prices for these types of commodities are usually subject to market fluctuations.

This poses a major challenge for the whole macroeconomic policy. The exchange rate stability was so fare the basis of macroeconomic stability. It is both an anchor for Belarusian monetary policy as well as an instrument of attractive saving schemes in Belarusian roubles offered by the banking system (around USD 5 billion). An abrupt change in this pattern would have numerous disruptive consequences for the stability of the banking system in particular and the economy in general. On the other hand, continuation of the past policies requires finding the sources for stabilizing the balance of payments and supporting the rouble exchange rate. The latter option is likely to remain one of the priorities for the government (one can foresee the trade deficit going from USD 2.5 billion in 2007, up to 3.5 billion in 2008). Up to now, there are two main ways to deal with the increasing trade deficit: borrowing on foreign financial markets and privatization. However, in both scenarios only a limited amount of money would be supplied for a short period.

The need to modernize production capacity and to increase energy efficiency (to lower the amount of primary energy used) would require large investments in the energy sector. Government and energy enterprises themselves are not able to make all of these investments. Some of them are expected to be financed by the private sector and foreign investors. However, the current state regulation policy does not allow such investments. Therefore, the government would have to change either approaches to the sector regulations (in favour of foreign investors) or find internal sources for ambitious modernization plans.

High gas prices and adaptation to world prices by 2011 creates challenges to the macroeconomic and social stability due to the risk of slower economic growth. Therefore, the government could try to use its ‘transit power’ in order to postpone price increases or considerably reduce them. It would create risks for the continuous transit of Russian gas and oil to Europe. In other words, Russia turns out to be interested in Belarus playing according to the international rules. By 2011, Belarus could limit its possibility to take loans for balancing supply and demand on the currency market and could fail to resist devaluating the Belarusian rouble.

The role of the state in the energy sector

The state plays a monopolistic role in the energy sector. There is no independent regulator. The Ministry of Energy plays this role in some business activities, while the Ministry of Economy and the Council of Ministers controls economic activities like tariff policy, access to the network and privatization, etc. All top-managers of energy enterprises are appointed only after presidential approval.

More information on sector performance, regulation and market progress is available in the publication “Belarus Infrastructure Monitoring”.

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Georgia

by Micheil Tokmazishvili

Summary & SWOT

GDP (current USD billion)	10.3	Average annual GDP growth 2000-2007, %	8.3
Population, million	4.4	GDP per capita (USD at PPP)	4690
Total Primary Energy Supply (TPES), Mtoe	3.2	TPES/GDP, Mtoe / 000 USD, base year 2000	0.74

SWOT analysis: Georgia

Strengths	Weaknesses
East-West Corridor and Caspian Sea –Black Sea Transit route North East transit corridor (Russia – Armenia)	Inherited dependence on supplies from limited number of sources (Russia) Lack of investments for the construction of new small and medium hydropower schemes Poor state of energy infrastructure Lack of energy strategy Seasonal differences in electricity generation potential Financial difficulties of gas distribution companies creating barriers to their privatization
Opportunities	**Threats**
Privatization of all hydropower facilities Interest of Iran to expand gas supply to Black sea through Armenia-Georgia EU energy policy to diversify energy supply and use Caspian Sea – Black Sea route Development of Black Sea trade through development of oil terminals (Kulavi, Batumi) Development of refining capacities and cooperation with Caspian oil producers (plans of SOCAR and KMG to build refineries at Black Sea) Expansion of East-West transit capacity (especially with participation of Central Asian oil/gas producers)	Possibility of disruptions in gas/electricity supplies from Russia Lack of normalization of political relations with Russia Establishing of Russian monopoly on Caspian Sea (Central Asia) energy transit through territory of Russia as an alternative way of Caspian Sea-Black Sea route Regional imbalance of electricity production and consumption and vulnerability of the transmission grid

Georgia has no mineral energy resources but has some hydropower potential. Energy supply largely depends on imports, mainly from Russia and Azerbaijan. Political relations with Russia deteriorated recently, complicating the energy situation in the country. With the opening of the BTC and Baku - Tbilisi - Erzurum pipelines, the country has become an increasingly important transit corridor for Caspian Sea region oil and gas. This role is set to increase in the coming years.

Georgia imports all gas and petroleum products consumed locally. Gas import prices have increased substantially since 2006 and prompted Georgia to switch from Russian to the then cheaper Azerbaijani gas. Recent signals from Azerbaijan indicate that the price of Azerbaijani gas will likely increase during 2008.

Electricity generation mostly comes from hydropower plants (over 80%). There are substantial seasonal variations in power production with summer excess electricity exported to Turkey, Azerbaijan and Armenia and imports from these countries during the winter period. The building of high voltage links with these countries would enable more sizeable electricity exports. Czech investors and RAO UES are important players in the domestic electricity sector. Progress in electricity sector reform looks favourable compared to other CIS countries, but the reform agenda is not completed yet.

Kazakhstani state-owned KazMunaiGaz is an important investor in the gas distribution sector and in two oil terminals, at Kulevi and Batumi, while the oil terminal in Supsa is operated by a subsidiary of AIOC, a BP-led international consortium operating the BTC pipeline.

Energy production, consumption and exports / imports – key data & key players

	1995	2000	2005	2006	Source
Electricity Production (GWh)	7082	7451	7267	7654	Georgian National Energy Regulatory Commission
HPP	6383	5952	6236	5392	
TPP	699	1499	1031	2262	
Electricity imports	754.1	592	1468	857	Ministry of Economic Development of Georgia, Department for Statistics;
Electricity exports	-	167	122	83	
Electricity consumption	5843.6	7013.3	8379	8449	Georgian National Energy Regulatory Commission
Crude Oil production (thousand tonnes)	43	110	67	64	Ministry of Energy of Georgia
Crude oil imports	-	1.5	-	-	Ministry of Economic Development of Georgia, Department for Statistics;
Crude oil exports	29	79	64	60	
Crude oil consumption (Oil refinery)	50	45	5	-	Ministry of Energy of Georgia
Oil products (thousand tonnes)					
Imports	94	478	741		Ministry of Economic Development of Georgia, Department for Statistics;
Exports	4	2	3	-	
Consumption of oil products (thousand tonnes)	90	476	739		Ministry of Energy of Georgia
Gas Production (tcm)	3.3	19.8	14.8	21.4	Ministry of Economic Development of Georgia, Department for Statistics
Imports	917.6	1192.9	1440.1	1881.2	
Exports	-	-	-	-	
Gas Consumption (tcm)	920	1212.3	1455.7	1902	Ministry of Economic Development of Georgia, Department for Statistics

The energy balance is designed by the Department for Statistics under the Ministry of Economic Development of Georgia. The Ministry of Energy, the Wholesale Energy Market and the Georgian National Energy Regulatory Commission, as well as energy generation powers provide original data inputs. Unclear measurements and poor accounting necessitates some “expert amendments” leading to larger potential error margins.

Some discrepancies that exist between the domestic and international (EIA, WB, IMF) figures are due to the assessments of above mentioned clauses. These discrepancies are not big, because a general source for international data is provided by the local Department for statistics. Moreover, later during the year, this agency makes corrections in the database, by the time the outdated information is internationally distributed.

However, it is better to rely on the data that is given by the Department for Statistics of Georgia as energy balance making institution.

Key players in the Energy Sector

The mission of the Ministry of Energy of Georgia is ensuring diversification of energy resources and maximal utilisation of domestic resources, in particular through increasing the role of hydropower in electricity generation as well as ensuring energy security and development of energy transportation infrastructure.

The Ministry of Economic Development of Georgia is in charge of operating the electricity system through the recently established (September 2006) Electricity System Commercial Operator (ESCO). ESCO is 100% state-owned, buys and sells the balance electricity and reserve capacity. It is a commercial organization and profit oriented. There are plans to distribute 30% of ESCO shares among the energy sector licensees, distribution companies and direct customers, 35% among the electricity generating – and 35% among the dispatch licensee organizations.

ESCO operates by the service tariff established by Georgian Energy Regulatory Commission.

In Georgia, gas pipelines and high voltage network transmission remains in state ownership. In 2006 the state-owned holding Oil and Gas Corporation of Georgia was created which unites formerly separate companies: Georgian International Oil Corporation (GIOC), Georgian Gas International Corporation (GGIC) and a refinery (“Saknaftobi”).

The majority of high voltage network transmission lines and substations – unified in the “Georgian State Electro system” – are managed by the Irish company ESBI until 2008. The strategically important 500 kV transmission line (Kavkasioni) originating in Russia and providing for the interconnectivity of many electricity transmission lines is managed by the Russian-Georgian enterprise (the Russian side is represented by RAO UES) JS “Sakrusenergo”.

RAO UES is an important investor in the Georgian electricity sector. It operates two (out of 20 privately owned) hydropower plants: “Tbilsresi” and “Khrami HPP”, and one thermal plant – “Mtkvari TPP”, (generating approximately 20% of domestic consumption). It is also the owner of “Telasi”, which is the distribution company for Tbilisi (under a 25-year management contract expiring in 2022).

Czech Company Energo-Pro Georgia is one of the largest transmission companies on the Georgian energy market that owns networks throughout the territory of Georgia: Georgian United Energy Distribution Company, Adjara Energy Distribution Company and six hydroelectric plants. Its sales account for around 40% of electric energy consumption in Georgia.

The gas supply system of Georgia includes 32 enterprises (2005). In the mid-1990s, the state-owned gas distribution system disintegrated and gas facilities were transferred to municipalities, which – due to financial problems – sold share tranches of the six companies to the former Georgian Gas International Corporation (GGIC).

"Tbilgazi", operating in Tbilisi, is the biggest among the regional gas distribution companies (in 2005 it distributed more then 1/3 of the total volume of gas consumed in Georgia). In 2006, "Tbilgazi" was purchased by "Kaztransgas" (a division of Kazakh KazMunaiGaz).

Kazakh state oil firm KazMunaiGaz owns the Kulevi oil terminal and together with French bank BNP Paribas holds the Batumi oil terminal. Another oil terminal, Supsa, is under the ownership of BP. BP is the main operator and shareholder of BTC and BTE Co.

In spite of the small indigenous oil resources, there are five foreign oil and gas extracting companies engaged in Georgia. Among them **"**Canargo Energy Group", that surveys three sections of the Black Sea shelf and "Frontera", that is active in Western Georgia. Starting from 2007, several new companies have started geological operations: "Global oil and Energy" Limited", which is registered in the Virginia islands, "Aksai BMS" and "Straight Oil and Gas" limited" – registered in Gibraltar.

Selected facts on the energy sector

The Georgian economy was always dependant on imported energy. During 1990-2002, both energy production and consumption were declining, but from 2002 (for gas) and 2005 (for electricity), these parameters started to increase.

Recently the rehabilitation of hydroelectric power generation and domestic gas pipelines reduced energy losses. Organizational measures were carried out in electric power engineering and electricity bill collections that were very low during many years, after which the energy sector of the country became more stable. The local production of energy resources has increased (consumption increased as well).

In wintertime, Georgia does not produce enough electricity with its hydropower plants and thus needs to import electricity from its neighbour countries. During the summer months, Georgia is a net exporter of power. Seasonal electricity exchange arrangements are in place with Turkey, Azerbaijan and Armenia. The government is contemplating additional investment in the construction of high voltage lines to three neighbouring countries (Turkey, Azerbaijan and Armenia). This would enable Georgia to raise its annual electricity export capacity and transform Georgia into a permanent net exporter of electricity and a regional hub for electricity distribution.

Georgia's hydropower potential is estimated at up to 80 billion kWh annually. (Pre-feasibility Review of 500 kV Transmission line – South Georgia 2006. p.5). Despite this large potential, there is a significant generation-load imbalance in the Georgian power system: two-thirds of Georgia's energy resources are located in the northwestern part of the country, while two thirds of the domestic demand is located in Eastern Georgia, and most of the expected export market is located in countries to the south of Georgia. At present only one strong line connects West and East Georgia, the 500 kV transmission line "Imereti" – "Kartli-II" – "Kartli-I". There is a constant power flow from east to west and in case of any fault on this line, especially during autumn or winter, a large power deficit in the east is incurred. There is no alternative route, which could be used to deliver power from West to East. This is obviously a threat for the economy and the country's ability to reliably interconnect with neighbouring countries' systems. Having only one 500 kV longitudinal backbone between generation and load in the Georgian system not only reduces internal reliability of the grid, but also limits existing and future power swap or export potential.

Limited financial resources considerably hamper investment into electricity generation capacity with new technologies. This negatively affects the utilization of the hydropower potential of Georgia. At present loans to energy projects account for only 2-2.5% of the total bank credits portfolio (George S, Billmeier A, Ding S, Fedorov K, Yackovlev I, Zeuner J. 2006. p. 10). It means that local bankers are viewing the energy sector as too risky an investment. This long-lived attitude to the energy sector restricts investment and checks its development.

The lack of significant domestic fuel reserves made the Georgian economy dependent on neighbouring countries, especially Russia, to meet its energy needs. Until the recently constructed pipelines were put into operation – Baku-Tbilisi-Ceyhan (2002), Baku-Supsa (1999), Iran-Azerbaijan- Georgia (2005) – Georgia fully depended on energy imports from Russia.

The Baku-Tbilisi-Ceyhan oil pipeline throughout capacity is about 50 Mt/year. This pipeline allows a million barrels of oil a day to be transported safely from the Caspian Sea. The pipeline is 863 to 1168 mm in diameter and contains 8 pump stations and 98 valve stations across the three transit countries.

Baku-Supsa is smaller. The projected capacity of the pipeline is 6-7 Mt/year. The Supsa terminal is part of this pipeline infrastructure, having four reservoirs with a volume of 40 thousand tonnes. The 8.2 km-long sub-sea pipeline extends from the terminal to a floating facility where tankers are loaded with crude oil.

The capacity of the Baku (Azerbaijan)-Tbilisi-Erzurum (Turkey) gas pipeline is planned to reach 30 bcm/year.

At present, Georgia has three sea terminals from which Caspian oil is transported to the rest of the world. One is situated in Supsa, with a capacity of 200,000 barrels/day and another in the seaport of Batumi, with a same capacity of 200,000 barrels/day. (For comparison: the Russian port – Novorossiysk capacity is about 680,000 barrels/day). Kulevi Oil terminal consists of 16 tanks with a capacity of 22 tcm, each serviced by railway that can transport up to 10 Mt of oil annually. It is planning to increase tranports to 35 Mt.

Georgia has already become a rail transit centre for Caspian oil and over 50,000 barrels/day from the Tengiz project in Kazakhstan were shipped across the Caspian Sea by barge to Azerbaijan and carried across Azerbaijan and Georgia by rail.

To enable diversification of energy imports the Iran-Azerbaijan-Georgia (IAG) gas pipeline with a total capacity 3.5 bcm/year, was rehabilitated and was put to use within 72 hours of the Russian supply interruption in January 2005.

The importance of the energy sector in the economy

Electricity (power) generation accounted for 24% of industrial production in 2006 (a decrease from the earlier years). The share of local crude oil production and oil products remained broadly stable at around 1.7-1.8% of industrial production. In total, electricity production amounted to 2.8% of GDP (Ministry of Economic Development of Georgia, Department for Statistics. 2005).

At the same time, gas consumption reached 2.5% and oil and oil products consumption to 7.0% of GDP. In 2007, these indicators will change due to the radical growth of the gas price. In exports, the share of oil and oil products is only 2%, while these products make up a 13.5% share in imports, compared with 3.5% and 9.8% in 2000, respectively. There is decreasing tendency of the oil and oil products share in total exports and an increasing tendency in imports.

Georgia as a whole, as well as Armenia, has a low energy intensity by regional standards, respectively 0.73 and 0.74 (toe/$GDP) (which is still much higher than that in EU countries) and a significant energy saving potential as energy losses are high. CIS economies with developed heavy industries and who are net exporters of primary energy resources, like Russia, Kazakhstan, Azerbaijan, Turkmenistan, and Uzbekistan, have an energy intensity that is roughly 3-4 times higher (Natural gas Strategy for Georgia, 2006).

Key macroeconomic issues related to the energy sector

Rapid increases of gas and electricity prices are the key challenge and these create problems that are mainly connected with the situation in the consumer market. Until 2006, relative prices of various fuels were set quite artificially. For example, the energy produced by burning gas, was approximately 3.5 times cheaper than electricity and 3-4 times cheaper compared to diesel fuel (Natural Gas Strategy for Georgia, 2006). Households adjusted to this old pricing structure by consuming mostly natural gas and electricity. Therefore, the rapid increases of prices of imported gas and petroleum as well as electricity started to hurt households and enterprises.

In 2006, the price of gas imported from Russia increased from USD 65 to USD 110 and in 2007, it reached USD 230 per 1000 cubic metre. Increased gas prices have a negative impact on GDP (it was thought the reduction of the GDP growth rate could be around 2 percentage points if one abstracted from the other countervailing forces, such as extra supply from Iran and Azerbaijan that can neutralize this negative impact (Georgian Economy at a Glance).

The increase of energy prices necessitate radical changes in the energy policy of the country, which has become a top priority. The situation is alarming because most enterprises use outdated energy-intensive technologies.

The role of the state in the energy sector

In Georgia, the Ministry of Energy has elaborated the Main Directions of State Policy Power Sector, aimed at utilization of local energy resources that shall be attributed to the application of main natural resources of the country. At the same time, the long-term goal of energy policy is to satisfy demand for electric energy with the power generated by local hydropower plants. The role of the state covers other main aspects of the energy sector: regulation of electricity and gas tariffs and management of strategic objects of distribution and generation that are state-owned. State regulators are independent institutions, which are separated from state ownership and regulate natural monopolies, where competition is limited. Regulatory authority and market governance is exercised by The Ministry of Energy, the National Energy Regulatory Commission, the State Authority for Oil and Gas Regulation, and the Electricity System Commercial Operator. All regulatory commissions have independent organizations.

Due to the reforms recently implemented in the energy sector of Georgia, the Georgian Wholesale Electricity Market is preparing for being liquidated and has been changed by the Limited Liability Company Electricity System Commercial Operator (ESCO), which is aimed at establishing new trade relations and long-term cooperation with enterprises, improving payment discipline, metering and monitoring systems, introduction of reserve capacities, etc.

After the "Rose revolution" in 2003, Georgia has made a greater effort to maintain energy sector development and simplify the tax burden on energy producers as well as consumers, simplified customs regulations and decreased corruption. At the same time, controlling authorities have been substantially reduced. All these institutional measures create incentives for encouraging domestic and foreign investment in the energy sector, and end the technological lingering of existing domestic energy companies.

At the moment about 20 HPP's are privately owned with only about one third of the total installed capacity used. The remaining one fifth of the state share of hydroelectricity plants and distribution companies has recently been put on the privatization list (except of "Enguri" HPP – one of the biggest HPPs, located in Abkhazia).

Most of the gas distribution companies experience financial difficulties. Part of the enterprises is non-profitable, which creates barriers for privatization.

As an owner of power stations and distribution networks, the government devotes every year about 8-10% of budget expenditures for the rehabilitation of existing energy systems and deposits it for future privatization. This practice has been intensified in recent years, aimed at involving private investments in order to improve the energy sector and assumes that privatization will further financial discipline.

Other issues

The relations with Russia are an important factor determining domestic energy sector development as well as the regional situation and prospects for diversification of Central Asian energy export routes. The route through Georgia is a potential alternative to routes controlled by Russia. This creates a natural rivalry as Russia is interested in keeping control over the Caspian energy transportation through the South Caucasus.

The relation with Russia worsened in 2006 due to political reasons and in relation to the Georgian refusal sell to Gazprom the main gas pipeline, which connects Russia to Armenia via Georgia. Russia then introduced an import ban on some Georgian agricultural products and introduced other measures (related to the Georgian population in Russia and air and road transport). This has prompted Georgian authorities to search for alternative sources of gas supply. According to Georgian official statements, as a result of a series of negotiations with the Azerbaijan government, starting from 2008 Azerbaijan may become the main gas supplier, which will reduce Georgia's dependence on Russia. However, at the time of writing this note, negotiation were still underway.

Georgia has the potential to become a significant transportation link between Russia and Armenia, which could involve Iran as well. Implementation of this North-South transportation corridor has its difficulties. It implies Russian participation, which may require better political relations. Moreover, Iran is at a geographic disadvantage, since the EU is more interested in the East-West infrastructure than in transporting more oil through the Persian Gulf. In this respect, it is important to note that Iran has a real interest in Georgia. Georgia forms a significant section of the transportation corridor linking Iran to Europe.

Georgia's potential as an energy transit country is not fully utilised at present. Central Asian countries (Kazakhstan and Turkmenistan) prefer to ship some of their production west via Batumi and Tbilisi through the Baku-Tbilisi-Erzurum gas pipeline, and this will enhance Georgia's role as an energy bridge in the Caucasus.

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Useful websites

www.minenergy.gov.ge - Ministry of Energy of Georgia

www.gnerc.org - Georgian National Energy Regulatory Commission

www.gwem.org.ge - Georgian Wholesale Electricity Market

http://statistics.ge -Ministry of Economic Development of Georgia, Department for Statistics. Data Base

Kazakhstan

by Sabit Bagirov

Summary & SWOT

GDP (current USD billion)	103.8	Average annual GDP growth 2000-2007, %	10.1
Population, million	15.1	GDP per capita (USD at PPP)	11086
Total Primary Energy Supply (TPES), Mtoe	52.4	TPES/GDP, Mtoe / 000 USD, base year 2000	2.01

SWOT analysis: Kazakhstan

Strengths	**Weaknesses**
Considerable oil and gas as well as coal and uranium reserves The country's location as a transit route for hydrocarbon reserves from neighbouring Turkmenistan and Uzbekistan Geographical proximity to growing energy markets (China)	Distance to markets in Western Europe Diversification of export routes requires cooperation of neighbouring transit countries (Russia and Azerbaijan) The physical obsolescence of power and gas networks
Opportunities	**Threats**
Increased production of oil and gas Diversification of the export routes of hydrocarbon resources Interest on the side of EU and other oil and gas consumers to diversify resource imports limiting the dependence on Middle East/Russia Regional cooperation in energy sphere (with Kazakhstan as a leader) Favourable macroeconomic developments in the country Modernization of Kazakh downstream industries Development of non-oil sectors of economy Increasing transit revenues The development of nuclear energy and diversification of energy supply	Unfavourable economic terms of oil and gas transit contracts with Russia Dutch disease – potential problem of non-energy sectors of the economy

Kazakhstan has the Caspian Sea region's largest recoverable crude oil reserves and is the largest oil producer in the region. It is also an important producer of gas, coal and uranium. Helped by large FDI inflows, the oil extraction sector has been experiencing a boom over the recent decade, strongly contributing to the robust growth of the whole economy. Oil and gas production is expected to more than double over the next 8-10 years, with most of the increase being exported. Coal plays a key role in electricity generation.

In view of the expected significant growth in oil and gas exports, the government is making efforts to develop and diversify export routes that still run mainly through Russia. Oil is shipped primarily through the CPC pipeline to Novorossiysk, and northwards to the Russian pipeline system, with smaller quantities also reaching China and Iran. Future, much larger, export volumes are expected to go through the expanded CPC pipeline (assuming Russian Transneft agrees with the expansion) and / or through the BTC pipeline, assuming infrastructure is built to ship Kazakh oil to the western coast of the Caspian Sea.

Current gas production levels are broadly on a par with domestic consumption. Potentially large future exports will require pipeline infrastructure to reach markets. One option involves sales to Russia (using the expanded Central Asia-Center pipeline). Other alternatives include sales to China and Europe – both of which may require or benefit from cooperation with Turkmenistan (to ensure sufficient gas volumes). As in the case of oil, Kazakhstan is trying to diversify its export options.

For the last three years Kazakhstan has been strengthening government control over the oil and gas sectors, limiting the role of foreign investors, forcing re-negotiations of some PSAs, notably on the massive Kashagan oil field and actively supporting the state-owned company KazMunaiGaz.

Energy production, consumption and exports / imports – key data & key players

	1991	1995	2000	2006	Source
Oil production (Mt)	26.6	20.6	35.3	66.1	BP (2007)
Oil consumption (Mt)	21.7	12.0	7.4	10.6	BP (2007)
Oil exports (Mt)	6.2 (1992 data)	7.3	26.1	53.2 (2005 data)	EIA
Gas production (bcm)	7.4	5.5	10.8	23.9	BP (2007)
Gas production (bcm)	7.9	5.9	11.5	25.6	Kazakhstani Statistics Agency
Domestic gas consumption (bcm)	13.2	10.8	9.7	20.2	BP (2007)
Gas exports (bcm)	-11.7 (1992)	-6	-4.9	8.26 (2005)	EIA
Coal production (Mt)	130.0	83.4	74.9	96.3	BP (2007)
Coal exports (Mt)	35 (1992)	19	24	23.4 (2003)	EIA

The website of the Kazakhstani Statistics Agency contains only very limited information. There are only small differences between the various sources (more substantial differences concern the volumes of gas production and consumption). The reasons for discrepancies are hard to explain in detail.

Key players in the energy sector

The extraction of oil and gas

The leading companies in this sector are KazMunaiGaz (http://www.kmg.kz/eng/, 14.7% of the total oil production in 2006) – a state-owned company with stakes in virtually all major oil and gas projects in the country (its structure can be compared to Gazprom and Rosneft – see Olcott, 2007 for details), Karachaganak Petroleum Operating BV (http://www.kpo.kz/, 16% of the total oil production in 2006) and Tengizchevroil (http://www.chevron.com/countries/kazakhstan/, 20.5% of the total oil production in 2006). These companies produce roughly two thirds of total oil extraction. Other players are PetroKazakhstan Ink, the Kazgermunay joint venture and KazMunaITeniz.

Oil and gas processing

This sector is represented by three oil refineries: Atirau, Pavlodar and Shymkent. In 2006, the volume of oil processing at these factories totalled 3.731 Mt, 3.897 Mt and 4.035 Mt respectively. The first two factories are run by KazMunayGaz and the third one is owned and run by PetroKazakhstan. There are also three gas refineries in Kazakhstan: the Kazakh gas refinery in Novy Uzen, the Zhanazhol gas refinery and the Tengiz gas refinery.

Power generation

The country's energy system includes: 1) the national electricity system (NES) represented by a joint-stock company – the Kazakhstan Electricity Grid Operating Company (KEGOC). It has been formed on the basis of interstate and inter-regional power grids 220-500-1,150 kW; 2) regional power companies (RPC) that include power-distributing networks of 110 kW and below and distribute electricity at a regional level; 3) power generators – power stations that are independent or integrated with major industrial facilities.

The largest power generator is the AES Corporation (USA) which owns the former Ekibastuz State District Power Station-1 (AES Ekibastuz) that generates 20% of all power in the country. Moreover, AES has a contract on the 30-year lease of two hydroelectric power stations (in Ust-Kamenogorsk and Shulbinsk), as well as four thermal power stations (Sogrinsk, Leninogorsk, Ust-Kamenogorsk and Semipalatinsk). Ekibastuz State District Power Station-2 which generates 10-12% of all power belongs to Russian RAO UES and the Republic of Kazakhstan.

Coal extraction

The largest coal manufacturers are “Bogatyr Access Komyr” (established by American Access Industries in 1996), the Eurasian Energy Corporation (owned by Eurasian Group, one of the largest Kazakh financial-industrial groups), “Ispat-Karmet” (the country's biggest steel producer, the other important investor in the Kazakh coal sector is Mittal Steel), the Kazakhmys corporation and Maykuben West. These five companies extract 88% of total coal production in the country.

Uranium production

The leading manufacturer is state-owned Kazatomprom and its joint ventures – the Katko joint venture with the French company Cogema and the “Inkay” joint venture with the Canadian company Cameco. A joint venture has been set up with the Russian Ministry of Atomic Energy to exploit the Zarechnoye deposit.

Selected facts on the energy sector

At the end of 2006, the amount of proved oil reserves totalled 5.5 billion tonnes and gas reserves – 3,000 bcm. The largest deposits are Kashagan, Tengiz, Karachaganak and Amangeldy. Other major deposits are Janajol, Korolevskoye, Kurmangazy, Kenbay, Uzen, Jatibay, Kalamkas, Karajanbas and others.

Oil production has been rising strongly over the last decade from just above 20 Mt in 1995 to above 66.1 Mt in 2006 (of which 57.1 Mt was exported). It is expected that in 2015, oil extraction will exceed 140 Mt and export will total no less than 110-120 Mt. The favourable investment situation and the signing of agreements on the exploration of oil and gas deposits with trans-national oil companies have furthered a sharp growth in the extraction and export of hydrocarbon reserves.

In 2004 Kazakhstan became a net exporter of gas, and while current export levels are low a major boost is expected with forecast production growing to 40 bcm in 2010, and 70 bcm in 2015, most of which for exports. There are chances that Kazakhstan will become the second largest Caspian producer and exporter of gas (after Turkmenistan).

The oil-processing industry remains mainly in state ownership. Unlike the oil-extracting sector, the volume of investment in processing assets is not sufficient. Serious reconstruction of refineries is required. The project of reconstructing the Atirau oil refinery (AOR) worth USD 400 million was completed in 2006. But a lot still has to be done in this sector.

The insufficient development of the infrastructure is the reason why a great amount of accompanying gas is flared.

Kazakhstan also has considerable coal reserves (3.4% of global reserves according to BP data) and significant production levels. Coal production tends to grow (91.5 Mt in 2006), but has not reached the level of 1990 yet. The coal industry enterprises have been privatized. Vertical integrated structures “coal-electricity” and “coal-metal” have been created, which ensures a stable market and profitable production. More than 30% of Kazakh coal production is exported mainly to Russian power stations. There are also some exports to other countries – Romania, Poland, the Czech Republic and Turkey.

Coal is the main (more than 80%) fuel for thermal power stations. Power is also generated at hydroelectric power stations (on the Irtysh River) and at thermal power stations using gas or fuel oil. Kazakhstan currently has 54 (71 according to EIA) operating thermal and five hydroelectric power stations with an overall established capacity of about 17 GW. The largest power stations are Ekibastuz State District Power Station-1 and State District Power Station-2, Aksu (former Yermakov) State District Power Station. The ageing of power stations reaches 70-80%.

Reforms in the country’s electricity sphere began in the mid-1990s. At the same time, the path has been taken to privatize generating capacity and attract foreign capital. At present, the handover and scheduling of power is concentrated in the hands of the state. The distribution of power is under mixed control (the state and private and municipal bodies). Private capital is present in the spheres of generation, distribution and sale. 80% of power generating facilities are private property. The basis of the electricity sphere is coal electricity based on cheap Ekibastuz coal. More than 85% of all power is generated at thermal power stations. 70% of thermal power stations are working on coal and only 15% on gas and fuel oil. The hydroelectric power sphere accounts for 12% of power generation.

According to forecasts, the maximum volume of power generation by 2008 will not exceed 73 billion kWh while the level of consumption will be 74 billion kWh, and a shortage of power is expected in 2008. In 2006, 71.6 billion kWh of power were generated.

Kazakhstan has almost 20% of the world's proved uranium deposits is also the main supplier of fuel tablets made at the Ulbinsk metallurgical plant for all types of Russian nuclear reactors. This factory is part of the National atomic company KazAtomProm. In 2006, a total of 5,279 tonnes of uranium were extracted.

At present, Kazakh oil is exported mainly to or via Russia, but other routes are also being developed / considered. The following routes are most important: Tengiz (Kazakhstan) – Novorossiysk (Russia) (CPC pipeline capacity to expected to doubled); Atirau (Kazakhstan) – Samara (Russia); Atasu (North-West Kazakhstan) – Alashkanou (Xinjiang, China). Kazakh oil is also exported by tankers to Baku and further to the Georgian Black Sea port of Batumi by railway or via the Baku-Supsa oil pipeline, and by sea to Makhachkala and Iranian Neka (swap deals). Kazakh oil will probably be exported by the Baku-Tbilisi-Ceyhan pipeline.

In 2006, Kazakhstan exported 57.1 Mt of oil. Of this amount, 24.4 Mt were transported by the CPC oil pipeline, 15.5 Mt by the Atirau-Samara oil pipeline, 2.2 Mt by the Atasu-Alashankou oil pipeline, 9.9 Mt through the port of Aktau, 2.4 Mt to Orenburg and 3.9 Mt to the Pavlodar petrochemical factory.

The importance of the energy sector in the economy

Oil industry contributed to around one third of the GDP growth rate (over 9% annually) over the recent few years (the rate of growth of the oil sector was slower in 2006, and other sectors of economy started to grow). More that half (72.7% in 2006) of the country's export revenues also falls to the oil sector of the economy.

The development of oil projects keeps direct foreign investments flowing into the country. From 1993 to 2005, the volume of foreign investments totalled almost USD 40 billion, of which 80% were investments in the oil, gas and metal extracting industries. In the period 2011-2015, the volume of investment in the development of Caspian oil projects is expected to be USD 15.5 billion.

Key macroeconomic issues related to the energy sector

Egert and Leonard (2007) in the recent study on Dutch disease in Kazakhstan conclude that available evidence "suggest[s] that from 1996 to 2005, non-oil manufacturing was spared the perverse effects of oil price increases despite the appreciation of the nominal and real exchange rate".

In 2000, the National Fund was set up with two functions: 1) to accumulate oil revenues for future generations (saving function) and 2) to reduce the dependence of the economy on unfavourable foreign factors (stabilizing function) such as a fall in oil prices on the world market. The financial assets of the fund are concentrated in the account of the government of the Republic of Kazakhstan in the National Bank. By mid-2007, the assets of the National Fund exceeded USD 18 billion.

The role of the state in the energy sector

According to the Wood Mackenzie survey, Kazakhstan belongs to the category of countries with a very high share of the state in the oil and gas sector – it exceeds 80% here.

The tax-budget regime in the country has conditions similar to those in North Africa and in the Middle East. Before January 2004, the tax-budget conditions of major Kazakh projects (Kashagan, Karachaganak and Tengiz) were assessed by most investors as being tough, but fairly reflecting the scale and quality of available reserves. The introduction of the Tax Code in 2004, even if we take account of amendments made in 2005, on the contrary, puts an even heavier burden on future investors.

Prices for oil fuel (gasoline, diesel, kerosene, LPG/fuel oil/gas) are controlled by the government.

Other issues

The prospects for economic growth in Kazakhstan are related largely to the development of the project on the exploitation of the exceedingly large offshore oil field Kashagan. Extractable oil reserves in this deposit are estimated at more than one billion tonnes. A contract was signed with the international consortium Agip KCO, in which 18.52% belongs to Eni, Total, ExxonMobil and Shell each, another 9.26% – to ConocoPhillips, and 8.33% to KazMunaiGaz and Inpex each. The development of the deposit should have begun in 2005; however, the operator postponed the moment of putting the deposit into operation until 2010 and said that the cost of the project would double. Eni explained the delay by complex geological conditions of the deposit. The delay and rising of costs diminished the long-term benefits to Kazakhstan. The situation surrounding Kashagan was very tense, with difficult negotiations on a revision of the original PSA continuing until mid-January 2008. The agreed solution was that foreign companies agreed to pay Kazakhstan USD 2.5-4.5 billion in compensation for the project's late start and sell shares to KazMunaiGaz, so that the share of its participation would be doubled to 16.8%, equalling the holdings of the largest western members of the consortium also implying a bigger role in running the project.

In turn, foreign investors are concerned about a number of steps taken by the government to toughen conditions: "Amendments to the Tax Code, as well as the law on the environment and users of mineral resources dictate other stricter conditions for foreign investors, for example: the state has the right to half of the share in every new project, as well as on secondary markets; the Ministry of Environmental Protection has toughened control; there is a mandatory requirement to use "local contents" (Kazakh work force and Kazakh servicing companies); a two-year moratorium has been imposed on the sale of licenses for use of mineral resources; the factor of national security is used as a reason to deny a license to use mineral resources." This is mainly related to conditions of earlier contracts, which a number of government officials and representatives of public organizations think do not comply with national interests.

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Kyrgyzstan

by Aziz Atamanov

Summary & SWOT

GDP (current USD billion)	3.7	Average annual GDP growth 2000-2007, %	4.3
Population, million	5.3	GDP per capita (USD at PPP)	1999
Total Primary Energy Supply (TPES), Mtoe	2.8	TPES/GDP, Mtoe / 000 USD, base year 2000	1.70

SWOT analysis: Kyrgyzstan

Strengths	**Weaknesses**
Extensive hydro resources Established internal electricity network Geographical proximity to primary energy suppliers and electricity purchasers Low estimated costs of electricity production. Transit role in gas transports to Kazakhstan	Limited indigenous energy resources requiring (external, problems with finding domestic investors) investment for their exploration High dependence on imported energy (gas, petroleum and petroleum products) Non-effective, highly bureaucratized system of management in companies producing, transferring and distributing electricity Barter payment for electricity (gas from Uzbekistan) High level of corruption in electricity sector Depreciating and ageing of physical infrastructure, lack of infrastructure to export electricity Huge commercial and technical losses
Opportunities	**Threats**
Increased demand for electricity in neighbouring countries Higher tariffs on electricity Shown interest in investing in hydroelectric plants Construction of Kambarata electricity stations Privatisation of distribution companies Possibility of gas transit expansion (option of expanding gas pipeline and reaching Xingjang) Potential of raising energy self-sufficiency (restoring coal industry, increasing use of hydro-resources)	Further deterioration of domestic infrastructure Fiscal problems as a result of explicit and implicit subsidies Lack of a clear strategy for the development of energy sector Increasing prices on imported energy commodities Seasonal export quotas introduced by Kazakhstan on petroleum products Drought - regional problems/conflicts over water use

In view of its very low levels of domestic production, Kyrgyzstan relies on imports of gas (mainly from Uzbekistan) and oil and oil products (from Russia and Kazakhstan). The country has significant hydropower generation potential, which is currently utilised only to a limited degree.

Hydropower accounts for around 90% of generated electricity and allows for exports to Kazakhstan, Uzbekistan, Russia and China. These exports have been declining in recent years, partly due to persistently very high electricity losses resulting from the dismal state of transmission lines. The electricity sector is largely unreformed, with a dominance of state-ownership units and substantial tariff distortions, while electricity provision is not very reliable (with frequent outages).

Kyrgyzstan is an important element of the water-energy interrelations in Central Asia, where the Kyrgyz Republic (as well as Tajikistan) would prefer to release water for electricity production in winter and accumulate it in summer, while neighbouring downstream countries (Kazakhstan and Uzbekistan) need water for irrigation in spring and summer. Cooperation between all the countries involved is far from satisfactory. Kyrgyzstan is planning privatization of its transit gas company and is eager to attract investment into gas exploration (which is currently minimal). Gazprom appears likely to enter the Kyrgyz market on this occasion.

Energy production, consumption and exports / imports – key data & key players

	1999	2001	2005	Source
Electricity production (million kilowatt per hour)	12975	13469	n/a	Energy Information Administration
Domestic consumption	10017	10678	n/a	
Imports of electricity	6250	322	n/a	
Exports of electricity	8300	2170	n/a	
Electricity production (million kilowatt per hour)	13159	13667	14892	National Statistic Committee, energy balance of the Kyrgyz Republic[119]
Domestic consumption	7506	6780	7096	
Imports of electricity	6390	6353	0	
Exports of electricity	8296	8431	2661	
Losses	3747	4802	5135	
Imports of electricity	184	322	0	Data from the National Bank of the Kyrgyz Republic, Balance of Payment based the data from the National Statistic Committee
Exports of electricity	2011	2165	2685	
Crude Oil, Natural Gas Plant Liquids, and Other liquids production (‘000 tonnes)	81	100	96	Energy Information Administration
Imports of Crude Oil, Natural Gas Plant Liquids,	n/a	n/a	n/a	
Domestic Crude Oil, Natural Gas Plant Liquids, and other liquids consumption	578	461	597	
Exports of oil	n/a	n/a	n/a	

119 The energy balance is not available online, but on the website of the National Statistic Committee one may find information on the production of energy. Visit the link: http://www.stat.kg/Rus/Database/TAB8.xls

	1999	2001	2005	Source
Crude oil production	77	76	78	National Statistic Committee, energy balance of the Kyrgyz Republic
Import of Crude Oil	65		5	
Domestic Crude Oil consumption	140	76	80	
Gas production (million cubic meters)	10	16	30	Energy Information Administration
Import of gas	1876	1988	700	
Domestic gas consumption	1876	1988	728	
Gas exports	0	0	0	
Gas production (million cubic meters)	25	33	25	National Statistic Committee, energy balance of the Kyrgyz Republic
Import of gas	575	666	711	
Domestic gas consumption	595	676	627	
Gas exports	0	0	0	

One Internet source containing comprehensive data (time series) on the Kyrgyz energy sector is the Energy Information Administration. The main domestic source of information on the energy balance is the data from the National Statistic Committee (NSC). There was also an energy balance prepared by state enterprise KyrgyzEnergo, but as it has been unbundled, it is not clear if this information exists anymore.

Before comparing data from two sources, we should mention that domestic data for export and import of electricity in the energy balance for several years was different from ordinary data on export and import of electricity (external statistics published by the National Bank and based on the data from National Statistic Committee). As it has been explained in the National Statistic Committee, this discrepancy was caused by double counting of electricity, when Kyrgyz electricity comes to the Kyrgyz citizens going through Uzbekistan.

In general, there are no huge discrepancies in production/generation data for all types of energy between domestic and international sources. However, as it was mentioned, export and import of electricity differ significantly due to the double counting. This issue can be resolved by using domestic ordinary data on export and import of electricity (external statistics published by the National Bank) which we believe is more reliable and transparent than taking data from international databases where data is also based on domestic sources, but adjusted using many non-transparent assumptions.

Discrepancies are also observed in oil and gas, especially in import (discrepancies with oil are related to the fact that the national source relates to crude oil, while international sources relate to oil, gas liquids and liquid production), but these sources of energy (domestic) do not play a big role in the Kyrgyz economy, while there are reliable domestic statistics reflecting imports of these types of energy commodities. Summing up, it is better to use domestic sources of information.

Key players in the energy sector

According to the WTO (2006), the energy sector in the Kyrgyz Republic mainly remains in state ownership. In 2001 state utility monopoly Kyrgyzenergo has been restructured into generation companies, transmission company „National Electrical Grid of Kyrgyzstan”, and four distribution companies for different geographical areas. All biggest power plants are also in state ownership.

In the sphere of crude oil and gas, KyrgyznefteGas (85.16% state-owned) is a sanctioned natural monopoly responsible for petroleum and natural gas exploration, and production and processing, transport, storage, and sale of petroleum products. This company is the only owner of boreholes for the production of crude oil and natural gas.

The same picture is observed with petroleum and petroleum products where the main producer is the Kyrgyz Petroleum Company (owned, in equal shares, by KyrgyznefteGas and a foreign company) at the Jalalabat city oil processing plant. There is also joint company “Vostok” in the north of the republic which is highly indebted.

There were non-tariff barriers to imports of petroleum products in the form of quotas on imports of light medium distillates, other types of raw materials and components for production of oil products, which were later replaced by licensing arrangements. These arrangements permit imports by certain approved firms.

Domestic coal companies are state-owned; they were not privatized because of the poor financial capacity. The state-owned (82.09%) gas company monopolist Kyrgyzgas is responsible for the gas transmission and distribution network. Kyrgyzgaz has the exclusive right to transact and import natural gas and liquefied natural gas from Uzbek's Uztransgas Company (WTO 2006).

Selected facts on the energy sector

Kyrgyzstan does not possess significant reserves of energy commodities in comparison to the neighbouring Kazakhstan and Uzbekistan which makes it dependent on the supply of energy resources from other countries (the Kyrgyz Republic has 2% of all energy resources of Central Asia) For instance, imports of mineral resources were three times higher than exports in 2006 (National Bank of the Kyrgyz Republic 2007).

Oil reserves are tiny (23 Mt), all deposits are located in the Fergana valley, and Kyrgyzstan has a limited extracting capacity (Stempien 2002). Kyrgyzstan re-exports petroleum products, which it imports from Kazakhstan and Russian federation, to the American Manas air base.

Natural gas plays an important role in the energy sector and accounted for 38% of Kyrgyzstan's total natural fuel consumption in 2005 (National Statistical Committee 2006). Almost 100% of gas is imported, mainly from Uzbekistan, which ties the supply of gas with the supply of water from Kyrgyzstan (in the form of electricity). The seasonal difference in water accumulation in Kyrgyzstan makes this relationship unstable.

The commercial relationship between the two countries has been difficult and very often there were delays with payment and consequent gas cut-offs. In addition, Tashkent also uses gas as an instrument of political pressure on Kyrgyzstan (Marat 2005). In 2007, the price of imported gas almost doubled compared to 2006 (to USD 100 per 1,000 cubic meters up from USD 55). There is also an agreement between the two countries on a barter scheme of gas and electricity (REGNUM, 2006). Currently, there are no alternatives to Uzbek gas. The largest northern pipeline system supplies Bishkek and is linked to the Uzbekistan-Almaty pipeline (WTO, 2006) which makes Kyrgyzstan a transit country heavily dependent on Uzbekistan.

Kyrgyzstan has vast hydrological resources and only 13% of its technical potential is used. As hydro resources are mainly used for electricity (90%) and heat generation, Kyrgyzstan has problems with neighbouring countries which need water for irrigation in summer, but not in winter. These issues are regulated by interstate agreements between Central Asian republics (World Bank, 2004)).

In spite of the huge hydro capacity in the Kyrgyz republic and full access of the population to electricity, systematic (commercial and technical) losses are enormous. Electrical infrastructure is in a critical condition that leads to constant damages and blackouts. According to estimates by the Ministry of Finance, the coefficient of wear is between 40-80%. For the development of the energy sector an investment of USD 3.5 billion is needed (Ministry of Finance 2006). Current tariffs on electricity are much lower than tariffs needed to cover costs and this leads to a huge quasi-fiscal deficit and consequently burden the state budget (Alymkulov and Izmailov 2006).

The importance of the energy sector in the economy

The energy sector accounted for 5% of GDP in 2005, 16% of industrial production and 10% of budget revenues (WTO 2006, IMF 2007a). In external trade, the energy sector plays an important role. Thus, in 2006 the share of exports of mineral resources in total exports was 19% (3% electricity and 16% exports of petroleum and petroleum products). The share of imports of mineral resources is even higher at 29% in 2006 (2% gas and 26% petroleum and petroleum products) (National Bank of the Kyrgyz Republic 2007). The electricity sector's quasi-fiscal deficit was estimated at 5.5% of GDP in 2006 (IMF 2007).

Key macroeconomic issues related to the energy sector

Due to low tariffs and huge losses, the quasi-fiscal budget deficit was 7.5% of GDP in 2006 (WTO 2006, Alymkulov and Izmailov 2006). The World Bank and the Kyrgyz Government developed a rehabilitation plan for the energy sector and it is planned to increase tariffs, decrease losses and as a result diminish the quasi-fiscal deficit to 5.5% of GDP in 2007 (IMF 2007).

There are no serious studies assessing the effect of the increase in gas price, but some consequences are evident. Doubling of prices for imported gas led to the increase of gas tariffs for the population by 50%, but its effect on inflation was negligible. Increased tariffs led to a higher burden on the budget due to an increased compensation for vulnerable people (no estimates are available). Regarding the financial position of KyrgyzGaz, it has worsened (increased accounts receivable, accounts payable (Parahod 2007).

It is important to mention the potential problem related to inflow of investment related to the construction of Kambarata hydroelectric stations. It is projected that investment may reach USD 1.7 billion and this will require shifts in monetary policy to absorb such a large amount of money.

The role of the state in the energy sector

According to the WTO (2006), the state plays a key role in the Kyrgyz energy sector. Tariffs and prices were regulated by the Anti-monopoly Agency (recently the State department on regulation of fuel and energy complex was created with mandate to set up and control tariffs); while in each sector there are state-owned enterprises with the monopoly rights to produce, process, and transport energy resources.

KyrgyznefteGas, the state-owned national oil and gas company (85.16%) operates in the market of petroleum and natural gas exploration, production, processing, transport, storage and sale. In the market of coal production, there are several state-owned companies which are listed as sanctioned monopolies, and the Anti-monopoly Agency approves wholesale coal prices. The state-owned gas company monopolist, Kyrgyzgas, owns and operates the transmission and distribution network. It is planned to be restructured into a separate transmission joint-stock company, and several distribution companies are to be formed and privatized.

In the electricity sector, the 93% state-owned utility monopoly, Kyrgyzenergo, has been restructured in 2001 into a generation company, a transmission company and four distribution companies. However, in spite of the fact that the Parliament approved privatization of four distribution companies, the privatization process stalled. Until 2006 the State Energy Agency regulated the sector, and later the Agency was closed and its functions were transferred to the Anti-monopoly Agency, but in 2007 the State department on regulation of fuel and energy complex was established under the Ministry of Industry, Energy and Fuel Resources. The main functions of the State department on regulation of fuel and energy complex are developing legislation, issuing licenses, developing and approving tariffs.

Other issues

The main weaknesses and vulnerabilities of the energy sector are: low or hardly extractable reserves of energy commodities, ageing of infrastructure and lack of investment, reliance on imported fuel resources, huge losses in the electricity sector, tariffs lower than the cost recovery level, a weak position in disputes with neighbouring countries regarding water utilization (World Bank 2005, Alymkulov and Izmailov 2006). In addition, deficiency of electricity (unreliable supplies, frequent blackouts and voltage drops) is the biggest problem, leading to low productivity in some industries (World Bank 2005:108).

Kyrgyzstan tries to attract foreign investment to its energy sector, presently the most promising and important project is the construction of the Kambarata cascade. It is planned that these two stations (Kambarata 1 and Kambarata 2) may produce 5,088 and 1,148 million kWh, which is 41% of the total level of production of electricity in 2005. It is planned that Kazakh and Russian companies will invest in this project and they agreed on establishing a joint company for preparation of the preliminary feasibility study for the construction of Kambarata stations (Sidorov 2007). Construction of these stations will allow controlling almost all water in the Naryn River flowing to downstream countries. There is no reliable information on the costs of electricity production at these stations, but some sources indicate that in order to be economically effective, the market should be able to pay USD cents 12-15 per kWh, which is a very high price and it is hard to predict whether there is enough market capacity to pay this amount (Marat 2007).

According to Hasnie (2004) and Peyrouse (2007) one of the most important unresolved issues for the region is the interlinkage between water use and energy trade. This problem has its origin in complementary endowments of the resources. Kyrgyzstan (lack of mineral resources) needs water to generate electricity in winter, while downstream Kazakhstan and Uzbekistan (rich in mineral resources) need water for irrigation purposes in spring and summer.

During the Soviet period, centralized management from Moscow settled this issue, but now priorities and interests of sovereign states do not necessarily coincide. Now the existing institutional framework for cross-border water and energy management is inadequate for addressing increasingly important issues. In addition, inadequate funding for operation and maintenance of upstream facilities (e.g. reservoirs) exacerbates the situation and has serious cross-border implications because they store water for downstream irrigation.

All this led to the creation of an arrangement in which the Kyrgyz Republic was compensated for releasing water in summer by energy resources from downstream countries. But the whole system was not transparent, with distorted prices and based on framework agreements (terms of engagement are often undermined by participants, downstream countries do not want to pay for irrigation mode in Kyrgyzstan, but require hard currency for supplied mineral resources). In addition, these agreements do not take into account weather conditions and it happens very often that Kyrgyzstan cannot release the agreed amount of water. In spite of the growing severity of the situation, however, the four states affected (including Tajikistan) have so far failed to reach a lasting agreement as to how to manage the crisis and prevent its reoccurrence (EC, 2006).

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Useful websites

http://www.nesk.energo.kg - National Electrical Grid

http://www.energo-es.kg/ - Electrical stations

www.stat.kg – National Statistical Committee

www.nbkr.kg – National Bank of the Kyrgyz Republic

Moldova

by Agata Łoskot

Summary & SWOT

GDP (current USD billion)	4.2	Average annual GDP growth 2000-2007, %	6.3
Population, million	3.4	GDP per capita (USD at PPP)	2901
Total Primary Energy Supply (TPES), Mtoe	3.56	TPES/GDP, Mtoe / 000 USD, base year 2000	1.97

SWOT analysis: Moldova

Strengths	**Weaknesses**
Location as a transit country (for natural gas) Advanced privatization of energy sector entities	Very limited indigenous energy resources High dependence on imported energy Heavy dependence on Russia as a supplier of gas Ageing physical infrastructure
Opportunities	**Threats**
Developing gas transit potential Diversification of energy supply sources Increased private sector participation Joining Energy Community and better integration with internal EU energy market	Disruption in energy supplies from Russia (particularly gas) Higher costs of energy imports, vulnerability to price hikes Further deterioration of the domestic infrastructure Unresolved problem of Transnistria and of its energy infrastructure (mainly of the biggest Moldovan power plant)

Moldova is one of the smallest energy markets in Europe and of the CIS countries. It has practically no domestic hydrocarbon resources and relies heavily on imported gas, petroleum products, coal for half of the domestic electricity demand. Moldova is also a transit corridor for Russian gas exports to Turkey and the Balkans.

Gas imported from Russia plays the most important role in the energy balance. The increases of import prices for natural gas, experienced in 2006, were passed on to consumers and were one of the drivers of inflation growth.

The very difficult situation in the power sector has obliged reform of the electricity distribution system (with a Spanish investor in a strong position). There are plans to build high voltage connections with Ukraine and Romania. The most important Moldovan power plant is located in the breakaway Transnistria province. Due to difficult relations with Transnistria and to the deterioration of generating capacities in the country, Moldova imports substantial amounts of electricity from Ukraine, Russia and Romania. A new gas-fired power plant is under construction in Burlecani with the participation of Russian companies (Gazprom and Itera).

Among recent new investments in the energy sector one can note the building of the Giurgiulesti oil terminal on the Danube River. Its economic rationale remains to be proved.

Energy production, consumption and exports / imports – key data & key players

	1990	1995	2000	2005	2006*	Source
Oil & oil products demand (Mt)	2.87	1.08	0.46		0.64	Oil Information 2007, IEA
Oil products imports (Mt)	2.9	1.02	0.44		0.65	Oil Information 2007, IEA
Domestic gas consumption (bcm)	4.04	2.9	2.48		2.9	Natural Gas Information 2007, IEA
Gas imports (bcm)	4.04	3.0	2.48		2.9	Natural Gas Information 2007, IEA
Domestic coal supply (Mt)	4.51	1.31	0.18	0.167	0.11	Coal Information 2007, IEA
Coal imports (Mt)	4.52	1.31	0.14	0.166	0.11	Coal Information 2007, IEA
Electricity – gross production (GWh)	15466	6068	3310	3865	..	Electricity Information 2007, IEA
Electricity – energy supplied	11160	7321	4816	6749	..	Electricity Information 2007, IEA
Electricity imports	4489	1998	1785	3361	..	Electricity Information 2007, IEA
Electricity exports	7531	127	0	220	..	Electricity Information 2007, IEA

Note: * - IEA estimates for 2006.

Key players in the energy sector

a) oil products (import and trade)

LUKOIL-Moldova (owned by Lukoil) controlling 34% of gasoline and 40% of diesel fuel imports (2006 data); has own network of gas filling stations;

Petrom-Moldova (joint venture with 65% ownership by Petrom /Romania/); 16.7% Moldovan filling stations; fuel market shares - 30% and 18%;

Tirex-Petrol (93% - Mabanaft Moldova GmbH /Switzerland/ part of Marquard & Bahls AG /Germany/); 21% Moldovan filling stations; fuel market shares - 8% and 16%;

Rompetrol-Moldova (90% - Rompetrol Group, which is in 75% owned by KazMunaiGaz)

ICS Danube Logistics SRL (20% - EBRD, 80% - EasEur Holding B.V. Netherlands, a daughter of Eastern Capital N.V.) – owner of oil products terminal Giurgiulesti

b) gas

Moldovagaz JSC - natural gas transportation, distribution & supply company. A joint-venture of Gazprom (50% + share), the Moldovan state (35.5%) and the separatist Transnistria administration

Tiraspoltransgaz - natural gas transportation, distribution & supply company in the separatist Transnistria region of Moldova

c) electricity

generation

right-bank Moldova

Chisinau CHP-1 and **CHP-2** (capacity of both 300 MW)

CHP Nord (35 MW)

Hydro Power Plant in Dubasari and in Costesti

Transnistria

Power plant JSC **"Moldavskaia GRES"** in Cuciurgan (installed capacity 2500 MW) - owner RAO UES (Russia)

distribution

Union Fenosa (owns 81% of 3 out of 5 Moldovan power distribution companies)

RED Nord & **RED Nord Vest** - state-owned

Transnistria distributors:

RED Est, RED Sud-Est

Selected facts on the energy sector

Moldova's internal division and the existence of separatist Transnistria on the left bank of the Danube river has strongly affected functioning of the country's energy sector with problems related to divided infrastructure, property rights etc. This note is analyzing mostly data concerning the right-bank part of the Moldova – as information on the left-bank separatist Transnistria is not easily available. Transnistria constitutes – to a certain extent – a separate energy entity.

Moldova's own hydrocarbon deposits are negligible, so the country relies on imported fuels. Natural gas plays the main role with an almost 70% share in the primary energy balance (IEA data for 2005). The gasification rate of the country is less then 50% (end of 2006), but it is improving as the national gasification program has been implemented for 5 years now.

All gas is imported from Russia and its prices have substantially increased from USD 80/tcm in 2005 to USD 110 in the first half of 2006, USD 160 in the second half of 2006 and USD 170 in 2007. This caused a demand response with consumption levels below the IEA forecasts. According to an agreement from early 2007 the price of gas will rise gradually in the next years to reach the average European level in 2011.

Moldova is a transit country for Russian gas exported to Balkan countries and Turkey. Its transit potential (about 45 bcm annually[120]) is not fully used (18-23 bcm is transited). In recent years, Moldova transited 11-12% of total Russian gas exports, at USD 2.50 per tcm for every 100 km.

Moldova's oil reserves are very small – estimated at about 2 Mt[121] - and not sufficient to satisfy internal demand. The deposit situated in the Valeni region is being developed by an American company: Redeco-Moldova. In 2005, the first Moldovan oil refinery was opened in Comrat, but it is very small and plays a negligible role in the domestic oil products market. Almost all oil products are imported from Russia (Lukoil-Moldova is the key player here) and Romania (Petrom-Moldova), coming by rail and road transport.

In September 2007, after 11 years of construction works the first Moldovan oil terminal (in the lower Danube) has started receiving tankers with petroleum products. The Giurgiulesti river port (accessible to sea vessels) has a transhipment capacity of 2 Mt annually (i.e. four times more than the current consumption level in Moldova). There are several doubts about the actual profitability of this investment, which was planned to increase Moldova's energy security (by opening an alternative route for petroleum products). Due to its location at the border with Romania and Ukraine, following investment planned (refinery and chain of 50 filling stations) and possibilities of transportation up the Danube, it could be used not only for the internal but possibly also for neighbouring markets. The current ownership structure of the terminal is somewhat unclear.

The most important Moldovan power plant (its installed capacity constitutes about 90% of total generating capacity in the country) is located on the Danube's left bank (in Transnistria), while most demand comes from the consumers on the right bank. Due to difficult relations with Transnistria and to the deterioration of generating capacities in the country, Moldova imports electricity from Ukraine, Russia and Romania. A new power plant is under construction (to be finished in 2008) in Burlecani with the participation of Russian companies (Gazprom and Itera).

Three out of five Moldovan power distribution companies supplying around 60% of the population in southern and central regions of the country, including the capital Chisinau, are privatized and are owned by Spanish Union Fenosa. The other two are state property.

The importance of the energy sector in the economy

Internal production of energy sector is of minor importance for Moldova's economy: electricity, heat, gas and water supply constitute only about 11% in industrial output and 2% of country gross value added, while mining respectively – 1.4% and 0.4% (2005)[122].

As practically all energy resources are imported, they are an important element of Moldova's current account balance[123]. Higher energy prices have led to sharp increases in energy imports

120 This is designed capacity as reported e.g. by http://www.inogate.org/en/resources/directory/moldova.pdf. At present maximum capacity might be lower (even at around 25 bcm at the Romanian border, cited by CERA) due to bad condition of pipelines.

121 http://www.eia.doe.gov/emeu/cabs/SE_Europe/Oil.html, accessed October 2007.

122 http://www.cisr-md.org/pdf/2007%20Transnis%20Report%20rus%201en.pdf, Tab.3 & Tab6., p.42-46.

123 http://bnm.md/en/docs/reports/30_6175.pdf, IMF Country Report No. 07/275, August 2007, p. 7.

value (by some 75% between 2004 and 2006) and their rising share in total imports – from below 20% in 2004 to 23.3% in 2006[124].

Electricity, gas and water supply sector attracted the biggest share of FDI (33% of total investments accumulated in 1992-2005)[125]. Giurgiulesti oil terminal was one of the main investments projects (totalling USD 250 million)[126], and it is the only international free port in the country.

Key macroeconomic issues related to the energy sector

One of the main challenges faced by the Moldovan economy in the last 2 years were sharp rises in the prices of imported natural gas. It was translated to hikes of tariffs paid by consumers, and increased inflation (in 2006 up to 14%[127]). It also illustrated the external vulnerability of the country and need of diversification of sources of energy (gas) and trade partners[128]. During 2007 the external conditions were ameliorating[129] – the gas prices issue appeared to be settled for future years (according to the agreement signed with Gazprom in early 2007 Moldova pays USD 170 USD/tcm and is to reach the 'European' price level in 2012). Their actual consequences for the economy seem also less severe then initially expected[130]. The rate of inflation in 2007 started to decrease although by mid-year it was still a two-digit number[131], the GDP growth was better then projected in 2006 and it is expected (IMF) to remain strong (at 5%)[132].

The role of the state in the energy sector

The role of the state in Moldova's energy sector is relatively low – compared with other CIS countries – and it will decrease in the next years. The state keeps a minority stake in Moldovagaz – a company responsible for imports, transit and distribution of natural gas, with a negligible share in oil products company Tirex – Petrol, and still owns of two out of five regional distributors of electricity. The state influences sector functioning via two institutions – the National Energy Regulatory Agency (ANRE) and the Ministry of Energy.

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124 http://bnm.md/en/docs/reports/30_6175.pdf,

125 http://www.state.gov/e/eeb/ifd/2007/80728.htm

126 e.g. http://economie.moldova.org/stiri/eng/24132/

127 http://bnm.md/en/docs/macroi/34_5898.pdf

128 http://ec.europa.eu/external_relations/moldova/donorconf/greceanii.pdf

129 Together with the gas prices issue, also the problem of Moldovan wine exports has been solved as Russia has formally lifted a ban it had imposed earlier.

130 http://www.imf.md/press/cr0745.pdf, http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2006/07/11/000016406_20060711113759/Rendered/PDF/wps3960.pdf, http://www.imf.md/press/cr07275.pdf

131 IMF Country Report No. 07/275, August 2007, p. 5

132 http://www.imf.md/press/cr07275.pdf

Other issues

There are several non-energy factors affecting the functioning of Moldova's energy sector. One of the most important is the issue of the Transnistria region and the evolution of its relations with the right-bank Moldova. Stabilization and improvement of those relations and the perspective of reintegration of Moldova would certainly have a positive effect on energy sector developments. In addition, the character of bilateral relations with Moldova's main partner in the energy sphere – Russia have proved to influence the situation in the sector, especially when it comes to gas issues. Moldova's possible accession to the Energy Community could yield positive effects on Moldova's energy security. Such a perspective leads also to reforms of the internal energy market leading to the harmonization of the country's energy regulation with that of the EU and to a better integration with the European market.

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http://www.eva.ac.at/enercee/md/energymarketactors.htm

Russia

by Julia Popova

Summary & SWOT

GDP (current USD billion)	1289.6	Average annual GDP growth 2000-2007, %	6.6
Population, million	142.1	GDP per capita (USD at PPP)	14692
Total Primary Energy Supply (TPES), Mtoe	646.7	TPES/GDP, Mtoe / 000 USD, base year 2000	1.85

SWOT analysis: Russia

Strengths	**Weaknesses**
Very rich natural resources endowment including oil, gas, coal, metals, timber, and hydropower Geographical location between Europe and Asian countries Developed oil and gas pipeline and electricity transmission line networks Control of transit pipelines for gas from Central Asia Established position as an important supplier of oil/gas to Europe Established refinery capacity, railroad and sea ports	Distance of oil/gas deposits from final markets and severe climate conditions of fuel-rich regions Ageing pipe and transmission lines infrastructure (decreasing capacities and high losses) Ageing fields and transmission infrastructure Slow capital investment in new fields/infrastructure and in upgrading of the old ones Energy inefficiency and greenhouse gas emissions Monopolization of the energy sector by state-owned entities Restrictions on foreign investment in the national energy sector Regulated domestic energy prices Poor international image of Russian business autocrats and oligarchs
Opportunities	**Threats**
Expansion of energy production, exploration, and exports of energy products Development of nuclear and hydropower energy sectors Expansion / upgrading of natural gas and oil pipeline network to Asia (China), and Europe Development of LNG technology Entering new markets (North America, Far East) Ability to attract investments in oil/gas production and exploration Restructuring and decentralizing of energy sector: natural gas, electricity, and transmission	Oil/gas export revenues dependence of state budget and economy growth Dutch disease (de-industrialisation) Inflationary pressures and slowdown of structural reforms State control over industries and domestic prices/tariffs Re-nationalisation of oil sector Worsening investment climate: lack of investment into new deposits and infrastructure Increasing role of the government in economic affairs

sectors	Subordination of energy sector development policies to foreign policy objectives

Russia is a key global energy player with the largest natural gas reserves in the world and substantial proved oil reserves. In 2006, it accounted for more than 12% of global crude oil production and about 22% of natural gas production, becoming the world's second largest producer and exporter of crude oil and the world's largest producer and exporter of natural gas. Russia is also a leading global producer and exporter of petroleum products, coal and electricity.

Following a period of rapid increase during 1999-2004, oil output has seen more modest gains more recently (around 2% annually) and such growth rate is expected to continue for at least a few more years.

Natural gas production has been increasing by 1-2% annually for the last few years. Over 80% of the total production comes from Gazprom, which also controls the pipeline network and has an export monopoly. Given the ageing of its major fields and little investment in new projects, Gazprom will not see any substantial rise in production over the next several years. Output increases are expected to come mainly from other gas producers (e.g. oil companies that currently flare most of the associated gas), but this will depend on their effective access to pipelines.

In contrast to other CIS oil and gas producers Russia controls a well-developed export pipeline infrastructure to supply the European market, although it needs maintenance and possibly expansion. It is actively pursuing a policy of limiting reliance on transit countries (mainly Ukraine and Belarus) in exports, by building new pipelines and sea terminals and taking control of infrastructure in other countries to gain direct access to final consumers. The medium- to long-term export capacity is subject to a wide margin of uncertainty.

For the last few years Russia has seen a strengthening of governmental control over the oil and gas sector, limiting the role of foreign investors, pushing re-negotiations of some PSAs (notably Sakhalin 2), forcing the bankruptcy of Yukos (a major private oil company) and actively supporting the state-owned companies Gazprom and Rosneft.

Energy production, consumption and exports / imports – key data & key players

	1999	2000	2001	2002	2003	2004	2005	2006	Source
Oil Proved Reserves, Mt	8076	8131	8813	9413	9904	10246	10791	10846	BP (2007)
Oil Production, Mt	304.8	323.3	348.1	379.6	421.4	458.8	470.0	480.5	BP (2007)
Oil production with condensate, Mt	304.7	323.4	348.1	378.6	408	443	470	480	Prime Tass
Oil Consumption Mt	126.2	123.5	122.3	123.5	123.4	124.1	123.3	128.5	BP (2007)

Oil Export, Mt	NA	NA	NA	NA	NA	239.6	233.1	227.6	FCO
Oil Products Export, Mt	NA	NA	NA	NA	NA	80.9	96.5	102.3	FCO
Gas Proved Reserves, trillion cubic metres	46.9	46.7	46.8	47	48	47.8	47.66	47.65	BP (2007)
Gas production, billion cubic metres (bcm)	563	555	551	561	581	591	636	656	Prime Tass
Gas production, bcm	551	545	542.4	555.4	578.6	591	598	612.1	BP (2007)
Gas production, bcm	590.08	584.42	581.02	595.75	616.71	634.28	640.79	NA	IEA
Gas production, bcm	NA	NA	584	581	NA	NA	NA	656	GKS
Gas consumption, bcm	363.6	377.2	372.7	388.9	392.9	401.9	405.1	432.1	BP (2007)
Gas Export, bcm	NA	NA	NA	NA	NA	180.7	187.2	182	FCO
Coal Production, Mt	249	258	269	253	275	280	298	309	Prime Tass
Coal Production, Mt	245.08	250.75	258.92	247.84	268.39	271.15	290.84	NA	IEA
Coal Consumption, Mt	234.09	239.50	230.11	228.19	232.24	225.50	234.39	239.72	IEA
Coal Export, Mt	NA	NA	NA	NA	NA	71.8	79.7	91.3	FCO
Electricity Generation, TWh	846.2	877.8	891.3	891.3	912.1	931.9	953.1	992.5	BP (2007)
Electricity Generation, TWh	845	876	888	889	915	931	952	991	Prime Tass
Electricity Generation, TWh	831.1	862.8	875.8	875.1	900.2	914.8	934.6	977.3	CDU

Data Sources

The main data source in the Russian Federation is the Federal State Statistics Service[133], which offers economic information covering district, regional and federal levels on all sectors of the economy. Distribution of statistical information is done via information and publishing centre "Statistics of Russia"[134] and Rosstat[135]. These data sources are believed to be the most reliable. The Federal Customs Office[136] offers information on exports/imports of all goods including oil, oil products, natural gas, and coal. The Central Dispatching Department of the Fuel Energy Complex[137] is Russia's only enterprise that collects and processes current information on domestic fuel and energy industries daily.

There are numerous sources of data on the energy sector coming from private information, news, and analytic companies. Among others are: (1) Russian Petroleum Investor[138] (specializes in the energy industry of Russia, publishing outlooks, analysis and statistics on the Russian energy sector); (2) Troika Dialog[139] (private investment bank in Russia, offering an extensive database on economic figures covering oil and gas industries); (3) Prime Tass[140] (business news agency).

The catalogue of websites represented by online portal http://www.prodcat.ru includes news, business, and companies' web pages of main Russian industries including oil/gas, coal, electricity, and oil products. Federal Tax Services[141] has essential information on taxes collected, federal budget's "ingredients", and tax statistics on main Russian industries and producers. The Russian oil/gas stock market is represented e.g. by the "Neft' Gas Fondoviy Rinok" enterprise[142].

Discrepancies in the different data sets mainly arise from different accounting methods and different sources of information.

Key Players

The Russian oil sector has undergone substantial liberalization and now is primarily restructured and privately held (unlike the gas industry, electricity sector, and transmission pipelines). Nowadays, there are more than 240 oil companies in Russia, but production is concentrated with 11 holding companies including Gazprom accounting for 95% of total output and the 6 largest companies (Rosneft, Gazpromneft, Lukoil, TNK-BP, Surgutneftegaz & Tatneft) accounting for more than 80% of total oil output in 2006. The natural gas industry is monopolized by Gazprom

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133 http://www.gks.ru/eng

134 http://www.infostat.ru

135 http://www.gmcgks.ru/

136 FCO http://www.customs.ru/ru/stats/stats/

137 CDU TEK http://www.riatec.ru/en/

138 http://www.rpi-inc.com/

139 http://www.troika.ru/ /index_eng.jsp

140 http://www.prime-tass.com

141 www.nalog.ru

142 http://www.ngfr.ru/about.html

(more than 85% of total production and monopoly on exports), but output of independent companies has been rising – worth mentioning are Novatec (4% of production in 2006), and Itera (US-based). It is worth to remember that gas output by independent Russian producers is still larger than the output of all other CIS countries combined.

- **RAO UES** ("Russian Joint Stock Company the United Energy System") is an electric power Holding Company with an installed capacity of 159.2 GW (72% of the total capacity); the company delivers around one-third of heat, and controls 96% of the total length of Russia' transmission lines (about 122,000 km of power lines, almost 58,000 km of which are high-voltage cables[143]). RAO UES is a 52% state-controlled company; it owns the central dispatch unit, and the federal wholesale electricity market (FOREM).
- **RosEnergoAtom** ("Russian State Concern for the Production of Electrical and Thermal Energy at Nuclear Power Plants")**:** Nuclear power generation (installed capacity 23GW) is under state control.
- **Transneft** (state-owned company) operates one of the largest networks of oil pipelines in the world: more than 50,000 km across Eastern Europe and Asia. It has a de facto monopoly on oil exports, accounting for transportation of about 93% of oil produced in Russia.
- **Gazprom:** the world-biggest gas concern totally controls geological exploration, production, transmission, storage, processing and marketing of natural gas. It accounts for around 85% of total gas production in Russia and about 20% of the world's output. More than 50% of Gazprom's stake belongs to the Russian government, which has de facto full control over the company. As of 2006, Gazprom owned 62 subsidiaries and had stakes in more than 100 companies in Russia and abroad – including in several CIS countries (www.gazprom.com).
- **Gazpromexport:** Gazprom's subsidary exporting natural gas, gas condensate, crude oil, petrochemicals, liquefied hydrocarbon gases, and other products of the oil, gas, and petrochemical industry to Eastern and Western Europe as well as to CIS countries. (http://www.gazexport.ru/)
- **Rosneft** is a vertically-integrated (state-owned) oil-and-gas company with proved oil and gas reserves of about 20 billion barrels of oil equivalent. It 2007 it became the largest crude oil producer in Russia with output in excess of 100 Mt (www.rosneft.ru).
- **Lukoil** is focused on exploration and production of oil and gas, production and marketing of petroleum products and petrochemicals. Its main fields are located in Western Siberia, while refineries, gas processing and petrochemical plants are in Eastern Europe and in Russia. Lukoil also explores and produces in Kazakhstan, Egypt, Azerbaijan, Uzbekistan, Saudi Arabia, Iran, Colombia, Venezuela, Cote d'Ivoire and Iraq (www.lukoil.com). Conoco Philips Co. bought a sizable tranche of shares. Lukoil is the only oil Russian company with a strong international portfolio.
- **Gazpromneft's** (former Sibneft), subsidiary of Gazprom, proved oil reserves exceed 4.5 billion barrels of oil, and it possesses over 1,800 filling stations in Russia including franchisees. The major part of reserves is located in Siberia (http://www.gazprom-neft.ru/).

143 http://www.fsk-ees.ru/about.html

- **Russneft:** is a top ten privately-owned oil Russian company. In the summer of 2007, the owner of Russneft, Mikhail Gutseriev, sold the business to an investor loyal to the Kremlin.[144].(http://eng.russneft.ru/)
- **Surgutnefetegaz's** is one of the top three state-owned oil companies in Russia, with an estimated 2.5 billion tonnes of oil and gas reserves in its West Siberian fields. Its main activities include prospecting, gas and oil field construction and development, production and marketing of oil, gas and petrochemical products.
- **TNK BP** (merger of BP's Russian assets (50%) and assets of Alfa Access Renova group (AAR), 50%) is a privately owned vertically integrated Russian oil company with principal fields in West and East Siberia, and refineries in Russia and Ukraine (www.tnk-bp.com). Owns about 50% of Slavneft.
- **Tatneft** (merger of NGDU (Oil and Gas Production Board) Elkhovneft and NGDU Zainskneft, NGDU Leninogorskneft and NGDU Irkenneft) is a holding structure, which incorporates oil and gas production boards, crude oil and gas refining companies, as well as enterprises and servicing works selling crude oil and also products of crude oil and gas refining and petrochemical products. (http://www.tatneft.ru/eng/index.htm)
- **Novatek** is an independent and the second-largest natural gas producer in Russia controlled by a group of private shareholders. The company is engaged in the exploration, production and processing of natural gas and liquid hydrocarbons and had 4.7 billion oil equivalent barrels of proved reserves at the end of 2006. (http://www.novatek.ru/eng/)
- **RosUkrEnergo** is a Swiss-registered venture company that transports natural gas from Turkmenistan to East European countries. Gazprom own 50% of RosUkrEnergo.

Table A.R.1 Oil Companies

Company	2005 oil production, Mt	Share of total
Lukoil	87.8	18.7%
TNK BP	75.3	16.0%
Rosneft	74.4	15.8%
Surgutnefetegaz	63.9	13.6%
Sibneft	33.0	7.0%
Tatneft	25.3	5.4%
Yukos	24.6	5.2%
Slavneft	24.2	5.1%
Gazprom	13.0	2.8%
Russneft	12.2	2.6%
Bashneft	11.9	2.5%
Novatek	2.4	0.5%
Others	22.0	4.7%
Total	470.1	100%

Source: Central dispatching department of fuel and energy complex

[144] http://www.iht.com/articles/2007/07/30/business/ruble.php

Selected facts on the energy sector

Oil

Russia possesses more than 6% of the world's oil reserves, it is the second-largest oil producing country, and it is the third-largest oil consuming country[145]. Most of Russia's proved oil reserves are located in Western Siberia. Other producing regions include the Volga-Urals region, the Timan-Pechora basin, the Dnipro-Donetsk basin, and the North Caucasus region. The most prospective new producing regions are Eastern Siberia and Sakhalin Island[146].

Oil output has been rising strongly until 2004, to slow down more recently. In 2007 oil production grew up by only 2% compared to 2006 and it was 491 Mt including gas condensate[147]. Russia's reserves of crude oil, although large, bear a cost structure and technological challenges that will soon impinge on the producers' ability to realize sizeable annual growth in production. Shrinking output from mature oil fields also plays a major role in the recent slowdown in Russian oil supply growth. Other challenges in the oil industry include: (1) government taxation of production and export revenues; (2) lack of clarity concerning the ownership of subsoil resources.

Over 70% of Russian crude oil is exported, while the rest is refined domestically, and some refined products are exported as well. Transneft – Russia's state-owned pipeline monopoly – transports crude oil via pipeline. Most of Russia's product exports to European countries consist of fuel oil and diesel fuel used for heating. Nowadays, the share of Europe's oil consumption that comes from Russia is around 25% (compared to 7.5% in 1995)[148]. Russia exports oil to Belarus, Ukraine, Lithuania, Germany, Poland, Hungary, Slovakia, the Czech Republic, China, the USA, the Mediterranean and Asia. The majority of Russia's oil exports (93%[149]) is transited via Transneft-controlled pipelines, but some oil is transported via other non-Transneft-controlled sea routes.

Table A.R.2 Crude Oil exports to non-CIS countries: 1995-2005 (Mt)

	1998	1999	2000	2001	2002	2003	2004	2005
Crude Oil exports to non-CIS countries	118	116	128	138	156	186	217	214.5

Source: Sosunov, Zamulin (2006).

Natural Gas

Russia has more than 26% of the world's natural gas reserves, and it is the largest gas producing country. Russian natural gas is sold in Europe (Germany, Italy, France, Austria, Finland, Switzerland, Hungary, the Czech Republic, Poland, Slovakia, Romania, Former Yugoslavia, and

145 BP Statistical Review of World Energy 2006

146 Roughly 25% of Russia's oil reserves and 6% of its gas reserves are in Sakhalin Island. Major oil producing/prospective basins and major oil refineries map can be found at http://www.eia.doe.gov/emeu/cabs/Russia/Maps.html.

147 http://www.gks.ru/bgd/free/B04_03/IssWWW.exe/Stg/d040/i040220r.htm

148 IEA country Analysis Brief Russia

149 http://www.transneft.ru/eng

Bulgaria), CIS countries (Ukraine, Belarus, the Baltic States, and Georgia), Turkey, Japan, China, and other Asian countries.

Gas output was 651 bcm in 2007, 1% below the 2006 level[150]. There are several factors due to which Russia's natural gas production growth has suffered, among them ageing fields, non-efficient exploration methods, lack of investment in new fields, Gazprom's monopoly power, state regulation of domestic tariffs and prices[151], and an insufficient and ageing export pipeline network. Despite near monopolistic control in the industry (85% of total output and 100% of exports[152]), it is believed by Russian authorities that the country's natural gas production growth will come from independent gas companies such as Novatek, Itera, and Northgaz. Gazprom's three major fields that are located in Western Siberia (Urengoy, Yamburg, and Medvezh'ye) produce more than 70% of Gazprom's total natural gas output, but are now in decline[153].

Coal

Russia has the second largest proved coal reserves in the world (after the USA) estimated at about 159 billion tonnes.[154] Russia is both a major coal producer and consumer, accounting for about 4.7% of the world's total annual coal production and about 3.6% of the world's total annual coal consumption in 2006 according to BP data[155]. According to the Federal State Statistics Service [156], 315 Mt of coal were produced in 2007, which is 1.5% more than in 2006. Coal in Russia is primarily used for power production and industrial consumption, including steelmaking. Roughly, 25% of Russia's electricity is produced in coal-fired power stations.

Despite safety concerns (mainly gas explosions) and economic problems, the coal industry remains a major element of Russia's current energy sector. In 2006 Russia exported more than 90 Mt of coal (about 9.5% of total world exports), which is 15% more than in 2005, according to the Russian Federal Customs Service[157]. Main export destinations in 2006 were: (1) 37% to Western Europe; (2) 24% to the Middle East; (3) 12% to former USSR republics; (4) 17% to the Asia-Pacific region; and (5) 10% to Eastern Europe.

As Russia faces a growing domestic appetite for electricity, the Russian government appears to be seeking alternative ways to meet this demand. It has repeatedly promised to increase coal use by raising the number of coal-fired power stations[158] producing about 40% of Russia's electricity

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150 http://www.gks.ru/bgd/free/B04_03/IssWWW.exe/Stg/d040/i040220r.htm

151 The law requires Gazprom to supply gas – used for district heating and power production – at below-market prices. This provides Gazprom with a strong incentive to export more and to manipulate the prices it charges foreign customers.

152 http://www.gazprom.ru/eng/articles/article20151.shtml

153 "Optimizing Russian Natural Gas – Reform and Climate Policy", IEA publication

154 In some Russian sources, reserves are estimated roughly at 272 billion tonnes. BP estimated Russia's proved coal reserves at 172,711 Mt or 17.3% of the world's total proved reserves in 2006.

155 Includes historical production and consumption of coal in Russia

156 http://www.gks.ru/bgd/free/B04_03/IssWWW.exe/Stg/d040/i040220r.htm

157 http://www.customs.ru/en/

158 Interfax news

between now and 2020. Reduction of natural gas consumption in power generation will maximize gas exports, and as a consequence ease Gazprom's task of meeting its increasing export commitments[159].

Nuclear Power

Currently, there are 10 operating nuclear power plants (NPP) in Russia, mostly located in the European part of the country: Balakovo, Leningrad, Beloyarsk, Bilibino, Volgodonsk, Kalinin, Kola, Kursk, Novovoronegh, and Smolensk[160]. In 2006 they produced about 16% of the electricity generated (157.7 billion kWh) in the country[161].

The interest in nuclear power engineering is growing every year due to the increasing energy demand. Despite limited domestic uranium fuel sources, Russians believe that the country needs to develop their nuclear industry[162]. Improvement of reactors' efficiency, construction of new up-to-date reactors and the use of the latest safety enhancement promising developments[163] will lead to multiple increases in nuclear fuel utilization. It is planned to increase nuclear power generation to 237 billion kWh by 2015 (53% more than in 2006)[164]

Hydropower

Russia possesses about 12% of the world hydropower reserves. Hydropower accounts for 21% of Russian's electricity production[165]. The largest hydropower plants (HPP) are located in Siberia on the rivers Yenisey and Angara: Krasnoyarskaya HPP (6 GW); Sayano-Shushenskaya HPP (6.7 GW); and Bratskaya HPP (4.5 GW).

Electricity Sector

Russia has over 220 GW of installed capacity to produce electricity. Due to the long Russian winters, about a third of electricity capacity is co-generation (heat and power). Electricity generation in Russia in 2006 was 977.4 billion kWh (4.6% increase from 2005). RAO UES produced 29.6 billion kWh (69.2% of the total). RAO UES used to be a monopoly in electricity production, but now is in the process of restructuring. It is planned that by the end of 2008, the full de-monopolization of the electricity sector will be completed and RAO UES will cease to exist. Russia exports electricity to Europe, CIS countries, China, and Japan.

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159 Domestic gas prices in Russia are only around 15-20% (IEA estimation) of the market rates. It is estimated Gazprom lost around USD 420 million in 2006 on domestic natural gas sales.

160 For an interactive map go to: http://www.rosenergoatom.com/en/nuclear_power_plants/

161 Other historical numbers can be found on the RosEnergoAtom web-site www.rosenergoatom.ru (RUS).

162 According to the Federal Agency of Natural Resources (www.rosnedra.com) Russia's proved reserves of uranium are 0.63 Mt. The major sources of nuclear fuel of the former USSR are located in Kazakhstan, Ukraine, and Central Asian republics.

163 More on this can be found: http://www.world-nuclear.org/info/inf06.html and Denisovskyi *et. al.* (2003)

164 www.rosenergoatom.ru/eng/about/activities/

165 http://www.gidroogk.ru/global/industry/rhydropower/ in Russian

Table A.R.3 Breakdown of Electricity Production in 2006 and Gains over 2005

Thermal power plants	602.7 billion kWh	+5.5%
Hydraulic power plants	174.1 billion kWh	+0.3%
Nuclear power plants	154.6 billion kWh	+4.7%
Isolated generating plants	46.0 billion kWh	+8.5%

Source: RAO UES: http://www.rao-ees.ru/en

Table A.R.4 Electricity Production by Source (% of total)

	1998	1999	2000	2001	2002	2003	2004
From coal source	19.67	19.09	20.04	18.98	19.15	18.83	17.29
From hydroelectric sources	19.18	18.99	18.72	19.55	18.24	17.04	18.91
From natural gas sources	41.82	42.42	42.26	42.36	43.26	44.49	45.30
From nuclear sources	12.75	14.42	14.91	15.40	15.93	16.44	15.56
From oil sources	6.39	4.84	3.78	3.38	3.08	2.97	2.70

Source: World Bank Development Indicators 2007

Pipelines/Transportation infrastructure

Natural gas produced in Russia is pumped into gas pipelines integrated in the Unified Gas Supply System of Russia (UGSS) owed by Gazprom. UGSS includes 155,000 km of pipelines, 268 compressor stations and gas-pumping units with a total power of 44.8 GW of gas pumping units, 6 gas processing and gas condensate plants, and 24 underground gas storage facilities (UGS)[166]. Gazprom is a shareholder, a user or plans to build UGSs in Ukraine, Latvia, Germany, Belgium, and Austria, Serbia, Hungary, UK, and Turkey. In 2005 about 62.6 bcm were kept in Russian UGSs; whereas by 2010 it is planned to keep about 82 bcm.

Gazprom is the leading distributor of gas in the Russian Federation. Russian natural gas is also exported to Europe and the CIS (Germany, Italy, Turkey, France, Great Britain, Hungary, the Slovak Republic, the Czech Republic, Poland, Ukraine, Belarus, Kazakhstan, Azerbaijan, Moldova, Lithuania, Armenia, Latvia, Georgia, Estonia, Japan, and South Korea). Among key international partners are E.ON, Wintershall AG, Verbundnetz Gas and Siemens AG in Germany; Gaz de France and TotalFinaElf in France; Italy's Eni; Botas in Turkey; Fortum in Finland; Gasunie in the Netherlands; Hydro and Statoil in Norway; CNPC and PetroChina in China; PGNiG in Poland; ExxonMobil, ChevronTexaco and ConocoPhillips in the US; and the transnational giant Royal Dutch Shell.

The UGSS is currently operating close to its capacity – in 2005 700 bcm of gas was transported using the system. It is planned to enlarge the capacity of UGSS by 35 bcm and keep building it up in the future[167]. At present the main investments in gas transmission system development will be committed to construction of the Yamal-Europe Russian pipeline section, SRTO-Torzhok and Pochinki-Izobilnoye gas pipelines, as well as expansion of the Urengoy gas transmission hub.

166 A detailed map can be found on http://www.gazprom.com/eng/articles/article20157.shtml

167 www.gazprom.ru

For independent producers, the rate of gas transmission via Gazprom's trunklines is set by the Federal Service for Tariffs. Before August 1, 2006, the single rate was RUR 23.84 per tcm/100 km From August 1, 2006, there is a new differentiated rate setting methodology, under which the rate is formed from two components: a RUR 5.28 charge for shipping 1 tcm per 100 km and a RUR per 1 tcm charge for using gas mains, which is approved depending on gas entry and exit points in the gas transmission system.

The majority of Russia's oil exports transit via Transneft-controlled pipelines[168]. There are a number of proposed new pipelines for oil[169] and natural gas[170]:(1) Yamal-Europe II gas pipeline – to Poland and Germany via Belarus; (2) Nord Stream – to Germany via Baltic Sea; (3) gas pipeline to China; (4) Blue (South) Stream gas pipeline – to Turkey via Black Sea; (5) Bosporus Bypass oil pipelines; (6) Baltic oil pipeline system expansion; (7) Tayshet – Skovorodino – Kozmino Bay oil and gas pipeline; (8) Murmansk Area and Kharyaga-Indiga oil pipeline; (9) Druzhba Pipeline and Adria Reversal pipeline. Transneft currently considers four main projects: (1) Expansion of the oil pipeline system to the Eastern Siberia-Pacific Ocean; (2) environmental security and safety of the Baltic Pipeline System; (3) Burgas-Alexandrupolis Pipeline Project; and (4) Druzhba-Adria Pipeline Integration Project[171].

With the increase in production and export of crude oil and its products, Russia needs to expand its refinery capacity. More on the problem in the refining sector within the energy sector in Russia can be found in Likhterova (2004) and Rudin (2007), for instance.

The importance of the energy sector in the economy

Oil-and-gas exports account for around 65% of all exports making the Federal Budget dependent on the energy sector. According to some estimates circulating in the Russian mass media, the revenues from oil-and-gas sales provide 75% of state budget revenues. However, the Ministry of Finance estimates that the share of oil-and-gas revenues in the 2006 budget was 52%; and in 2007 this figure dropped to 46%. Nevertheless, oil-and-gas exports will continue to be the crucial part of budget revenue. This natural-resource export dependence makes the Russian economy very vulnerable; any price fluctuation on the international oil-gas markets affects not only producing companies' revenues but also government spending on public goods.

In 2006, about 16% of GDP came from the oil industry. Gazprom itself accounts for about 25% of federal tax revenues[172]. Oil and natural gas exports are a crucial source of income and diplomatic power for Russia's government (for instance, energy disputes with Ukraine and

168 Detailed pipeline maps can be found on: http://www.transneft.ru/Shema/Shema.asp?LANG=EN (in Rus). Other maps can be found on IEA website http://www.eia.doe.gov/emeu/cabs/Russia/Maps.html

169 http://www.eia.doe.gov/emeu/cabs/Russia/Oil_exports.html and http://www.transneft.ru/Shema/Shema.asp?LANG=EN

170 http://www.gazprom.com/eng/articles/article20157.shtml and http://www.eia.doe.gov/emeu/cabs/Russia/Maps.html

171 http://www.transneft.ru/Projects/Default.asp?LANG=EN

172 The Russian Energy Ministry

Belarus)[173]. The importance of the oil sector in the Russian economy can be seen from the following numbers: GDP (2000) 8%; Federal tax revenues (2000) 39%; exports of crude oil and oil products (2002) 37%[174]. In 2005 about 32% of the Federal Budget came from taxes on natural resources use/production, in 2006 this number was about 36%[175] while production increased by not more than 2.5% in 2006 compared to 2005 (source is www.gks.ru). In other words, while production/use/export of natural resources increases marginally, the national economy's dependence on these economic activities grows significantly.

Macroeconomic issues related to the energy sector

High fuel prices helped Russia recover from the crises in 1998, but a glut of oil revenues has also allowed Russian government to postpone implementing necessary reforms (to invest in infrastructure, to reform the financial sector, and to give foreign investors and companies clear rules of conduct)[176]. As it was stated in the section above, public sector revenues come largely from natural-resources exports income, making government spending dependent on oil-gas exports. Therefore, an increasing dependency of the Russian economy on world market conditions, such as natural gas and oil prices, challenges future development.

Despite the strong growth of the Russian economy in recent years, some question its sustainability. Rautava (2002) concludes that oil prices and real exchange rates play a significant role in the Russian economy, and that their effects may be greater than generally acknowledged. Sosunov and Zamin (2006) investigate and find that both the increase in oil prices and the growth in volume of exported oil are responsible for the real appreciation of the Russian currency in 1998-2005. This may jeopardize the national economy growth, domestic savings and investments.

The growing volume of oil extraction and high world oil prices brings considerable oil and natural gas revenues to the country. In 2004 the Stabilization Fund (Fund hereafter) of the Russian Federation was established as a part of the federal budget to balance the federal budget at the time when oil price falls below a cut-off price, currently set at USD 27 per barrel. The key role of the Fund is "…to serve as an important tool for absorbing excessive liquidity, reducing inflationary pressure and insulating the economy from volatility of raw material export earnings…The capital of the Fund may be used to cover the federal budget deficit and for other purposes…"[177]. Many Russian media and analysts criticize the government for keeping the Fund intact. The general sentiment is that the oil-gas windfall money must be spent on social reforms as well as on investing into the economy to make it stronger and viable. In 2005 some of the Fund was spent on foreign debt repayment and on Pension Fund payments.

Adjustment of domestic tariffs to rising gas and oil prices is a big issue with potentially large macroeconomic and microeconomic effects. For many years oil-gas prices and public utility tariffs were kept below the costs of providing these commodities domestically. The positive

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173 Russia's political power associated with gas exports (much less so oil) are mostly related to a lack of realistic alternatives for the importing countries rather than the size of Russian exports.

174 http://www.tukkk.fi/pei/verkkojulkaisut/Liuhto_32003.pdf

175 www.nalog.ru

176 Ahred and Tompson (2006), and Henry and Gavrilenkov (2000)

177 http://www1.minfin.ru/en/stabfund/about/

difference between world prices and domestic tariffs induce the oil-gas industry to export excessively, leaving Russian consumers unsatisfied.

The role of the state in the energy sector

The state plays a dominant role in the energy sector. Until recently, this role was the lowest in oil production (though not oil transportation). However, recent years have witnessed a rising role of the state in the oil-producing sector as well. The share of state-owned oil companies in total production increased from 15% in 2003 to 25% in 2004, and 36% in 2005[178]. This trend is likely to continue given the recent Rosneft acquisitions. The Russian government controls the nuclear industry and electricity production, although demonopolization of the electricity industry has been launched. Gas and oil transmission pipelines are state-controlled monopolies. While the oil industry yet is mostly private and a big part of production/exports comes from private companies, the natural gas sector is mainly owned by the state (which has above 50% stake in Gazprom). Electricity tariffs and natural gas prices are under federal and/or local government control. Liberalization of the electricity sector is believed to ease governmental influence on the prices.

The Russian government has recently agreed to open the gas market to new players and to reconsider its domestic pricing strategy, starting with industrial customers.

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Tajikistan

based on materials prepared by Muhammadi Babaev

Summary & SWOT

GDP (current USD billion)	3.7	Average annual GDP growth 2000-2007, %	8.8
Population, million	6.4	GDP per capita (USD at PPP)	1841
Total Primary Energy Supply (TPES), Mtoe	3.5	TPES/GDP, Mtoe / 000 USD, base year 2000	2.24

SWOT analysis: Tajikistan

Strengths	**Weaknesses**
Large hydropower recourses Low estimated costs of electricity production Presence of feasibility plan for construction of hydropower stations Established internal and external electricity network	Conflict of interest between central Asian countries related to the utilization of water resources: power generation needs versus agricultural sector needs High dependence on imported energy (gas and petroleum products) Shortage of electricity in winter
Opportunities	**Threats**
Increased demand for electricity in neighbouring countries Investments by Iran and Russia in Sangtuda I, II hydropower station Investments into projected Rogun hydropower plant Potential discoveries of oil and gas deposits	Further increase in prices of energy resources Climate changes leading to lower hydropower potential High energy intensity of key sectors of the economy (aluminium) – dependence on imported energy Limited domestic resources to cofinance projects in the energy sector

The most important element of the energy sector in Tajikistan are the hydropower stations producing virtually all electricity generated in the country. Seasonal variations in generation capacity necessitate regional trade in electricity, although this is complicated by the difficult co-operation between the relevant Central Asian countries. From the perspective of Tajikistan, Uzbekistan is the key partner, also because Tajikistan imports all its natural gas from there. All petroleum products are also imported.

In the winter season, electricity outages are frequent, even in the capital city. Reform progress has been minimal and in particular domestic electricity tariffs are very low.

Energy production, consumption and exports / imports – key data & key players

	1991	1995	2000	2005	Source
Electricity production (million kilowatt per hour)	17597	14768	14247	17090	Statistic Committee, energy balance of the Republic of Tajikistan
Domestic electricity consumption	19148	15430	15580	17325	Statistical Yearbook of the Republic of Tajikistan
Imports of electricity	6941	4860	5242	4637	Statistical Yearbook of the Republic of Tajikistan
Exports of electricity	5390	4198	3909	4402	Statistical Yearbook of the Republic of Tajikistan
Losses	1783	1794	2164	2746	Statistical Yearbook of the Republic of Tajikistan
Gas production (million cubic meters)	92.5	38.8	40.0	29.4	Statistical Yearbook of the Republic of Tajikistan
Gas consumption (million cubic meters)	1879 (1992 data)	798	1236	1414	US Energy Information Administration
Coal consumption (thousand tonnes)	313	33.9	22.2	98.5	Statistical Yearbook of the Republic of Tajikistan
Oil consumption (thousand tonnes)	976 (1992 data)	651	1162	1494	US Energy Information Administration
Oil production (thousand tonnes)	108	26	18	22	Statistical Yearbook of the Republic of Tajikistan

Key players in the energy sector

The traditional players are Russian and Iranian companies. More recently, more relations were established with India and China, intergovernmental agreements and some small contracts were signed, and there is a possible increase of their presence in Tajikistan.

RAO UES, RusAl, Gazprom (aiming to explore, produce and sell Tajik gas) are active in the country.

MoU with Indian Bharat Heavy Electrical Limited (BHEL) and National Hydroelectric Power Corporation Ltd. (NHPC) are ready for the reconstruction of Hydropower station Varsob-1.

China: Sinohydro Corporation awarded a contract to build a Yavan hydroelectric plant in Pendjikent district, northern Tajikistan, Zerafshan River, 600 GWh annually, USD 200 million.

France: EdF, NEO (electrical power grids), Alstom and AREVA - contracts to build/renovate some segments of the Tajik electricity system with international financing.

Selected facts on the energy sector

The Tajik energy sector is based on domestically produced electricity, which comes almost exclusively (more than 97% in 2004) from hydropower stations (the remainder is produced in gas-fired power plants). This implies a seasonal variation in generation capacity and the need for regional trade in electricity, which is not without problems.

In the winter period, due to a reduction of the water level in the Nurek Hydro Power Station as well as technical problems (not all aggregates of Nurek and Kayrakum hydropower station operate), electricity is imported from Uzbekistan. However, during the last years Uzbekistan was restricting the supply of electricity to Tajikistan due to a lack of its production for domestic consumers. Tajikistan strives to import electricity from the Kyrgyz Republic and Turkmenistan (through Uzbekistan). However, this issue has not yet being solved because of problematic relations between Tajikistan and Uzbekistan. The Government of Tajikistan considers the solution of this problem in construction of three very large hydroelectric plants in Tajikistan, i.e. Rogun, Sangtuda 1 and Sangtuda 2 Hydro Power Stations.

Practically all gas and oil products consumed in Tajikistan are imported. Natural gas consumption has been broadly flat over the last years, partly owing to limitations on supplies from Uzbekistan. In 2006, Uzbekistan increased its price for gas from USD 50 to USD 110 per tcm.

The importance of the energy sector in the economy

The share of the energy sector in the economy has been declining for the last several years. According to the data from the Statistical Yearbook of the Republic of Tajikistan for 2006, back in 1995 the energy sector accounted for 20% of the industrial production, in 1997 11.5%, and between 2001 and 2005 this share fluctuated between 6.7% and 7.7%. The major part of electricity is consumed by the industrial sector (about 40% goes to aluminium production).

Key macroeconomic issues related to the energy sector

Supply of electricity to households – including in the capital city are unreliable. Blackouts are common. Domestic electricity tariffs are very low.

The role of the state in the energy sector

Production of electrical energy is mainly under control of state enterprise “Barki Tojik”, which is a state monopolist. Oil and gas production, and development of oil and gas deposits are the responsibility of the State Committee for Oil and Gas. The main importer of natural gas (all of which comes from Uzbekistan) is the state enterprise “Tajikgas”, which is a monopolist in the sale of gas to consumers in Tajikistan. Import and distribution of oil products is carried out by the State Company Tajiknefteproduct. Extraction of coal is concentrated in the hands of several companies, most of which belong to the state.

Turkmenistan

by Sabit Bagirov

Summary & SWOT

GDP (current USD billion)	26.9	Average annual GDP growth 2000-2007, %	14.8
Population, million	5.2	GDP per capita (USD at PPP)	5154
Total Primary Energy Supply (TPES), Mtoe	16.3	TPES/GDP, Mtoe / 000 USD, base year 2000	2.95

SWOT analysis: Turkmenistan

Strengths	**Weaknesses**
The presence of considerable gas reserves which make it possible to export large amounts of gas The presence of oil reserves which make it possible to meet the country's demand and also export oil and oil products in small quantities The presence of two export gas pipelines	Remoteness from the foreign gas market Neighbouring countries are either rich in gas themselves or are insolvent and high-risk countries The lack of a diversified system of export gas pipelines The physical obsolescence of the infrastructure Difficult investment climate Investors will need time to clarify the new rules of the game connected with the change in the country's leadership.
Opportunities	**Threats**
Increased production of domestic resources (oil and gas) Diversification of exports – expansion / creation of transit infrastructure Attraction of FDI Economic reforms	Disadvantageous conditions for gas transit through Russian territory (continuation of Russian near-monopoly on transit of Turkmen gas) Persistence of disputes / conflicts with neighbouring countries (e.g. with Azerbaijan over offshore fields and Caspian status)

Turkmenistan probably has the Caspian Sea region's largest gas reserves and is the largest gas producer and exporter in the region. Years of economic and political self-isolation, hardly any economic reforms in the country and lack of access to export gas pipelines other than towards Russia have severely limited development of the energy sector (and the country as a whole).

Following a dramatic decline in the late 1990s, the volume of gas production and exports has been on the rise in recent years, but has not reached the level of the late 1980s. Ninety percent of exports are directed to Russia and then via non-transparent deals with intermediaries partly controlled by Gazprom are mostly sold on to Ukraine. Limited quantities of gas are exported to Iran using a pipeline built back in 1997. Turkmenistan has a large, though uncertain, potential for a major expansion of gas exports. Pipeline infrastructure reaching final markets will be key in this process. The situation is very similar to that of Kazakhstan. One option involves intensification of sales to Russia (using the expanded Central Asia – Center pipeline). This project is strongly supported and lobbied by Gazprom. Other alternatives involve building pipelines to China or to the western coast of the Caspian Sea and then on to Europe, of which the Chinese option may be more likely to materialise following agreements signed in 2007.

Oil production potential is significantly lower and may allow some exports to regional markets, but does not matter much in total CIS exports. There are only a few relatively small-scale projects with foreign participation.

Power generation capacity (almost fully gas-fired) covers domestic demand and allows some exports, although inefficient power infrastructure leads to high losses.

Energy production, consumption and exports / imports – key data & key players

	1991	1995	2000	2006	Source
Oil production (Mt)	5.4	4.1	7.2	8.1	BP*
Oil production (Mt)	5.4**	4.5**	9.0**	8.5***	Article
Domestic oil consumption (Mt)	5.0	2.7	3.6	5.2	BP*
Gas production (bcm)	78.6	30.1	43.8	62.2	BP*
Gas production (bcm)	84.3**	32.3**	30.0**	65***	Article
Domestic gas consumption (bcm)	9.6	8.0	12.6	18.9	BP*
Gas export (bcm)		22.6****	33.7*****	48.5/2005*****	Article

* BP Statistical Review of World Energy June 2007, www.bp.com

** ТЭК России и стран Центральной Азии, http://www.eepnews.ru/publication/m4108

*** Нефть и газ туркменистана '2006, http://www.ngv.ru/article.aspx?articleID=24436

**** Гладко только на бумаге. "Подводные камни" газового партнерства России и Туркменистана Андрей Мещерин, Политический обозреватель.

http://www.ngv.ru/article.aspx?articleID=22567

***** Противогаз Туркмении, http://www.turkmenistan.ru/?page_id=6&lang_id=ru&elem_id=7646&type=event&sort=date_desc

Key players in the energy sector

The leading companies in the oil and gas sector are Turkmenneft (oil), Turkmengaz (gas), Turkmenneftgaz (oil processing, transportation and sale) and Turkmengeologia (geological exploration), which belong to the state.

The role of foreign companies in the oil and gas sector does not exceed 10%[179]. These companies are Petronas (Malaysia), Maersk Oil (Denmark), Burren Energy (Britain), Mitro International (Austria) and Dragon Oil (UAE-Britain). It is expected that China's CNPC, Russia's Lukoil and

179 Богатства кладовых «Голубого топлива». Газовая промышленность – «локомотив» экономики Туркменистана. Ахметджан НУРЫЕВ, 12.10.06; http://www.turkmenistan.ru/?page_id=5&lang_id=ru&elem_id=8705&type=event&sort=date_desc

Gazprom, American ExxonMobil, Japan's Itochu, British-Dutch Shell, Turkey's TPAO will become oil and gas extracting companies in the near future.

Selected facts on the energy sector

At the end of 2006, the proved reserves of natural gas totalled 2,860 bcm, according to BP. Rated by the volume of proved reserves, Turkmenistan takes the 13th place in the world and comes second (after Russia) among CIS countries. According to the state information service of Turkmenistan (TDH), new significant gas reserves were discovered in the south-eastern part of the country in March 2007. The real reserves of Turkmen gas are very difficult to assess and estimations range from 4,000 to 15,500 bcm. Ashgabat says that there are no less than 23,000 bcm, but no more than 42,000-44,000 bcm.[180] According to representatives of the state corporation Turkmengeologia, extractable hydrocarbon reserves total 30.6 billion tonnes of standard fuel.

In 2006, Turkmenistan took the 10th place in the world in the volume of extracted gas and ranked 4th in the volume of gas exports (according to BP).

The main region where gas is extracted is eastern Turkmenistan, which occupies an area of 180,000 km^2. More than 60 gas and gas condensate deposits have been discovered there, including the Dovletabad deposit, the potential of which is estimated at 4,500 bcm (most of the gas reserves have already been extracted and the rest of the reserves total about 700 bcm[181]), major deposits such as Iolotan (with reserves between 1.5 and 7 thousand bcm), Malay, Shatlyk, Ojak, Samantepe, etc. Geologists predict that there are major gas reserves in a vast area in the south-eastern part of the country – in the Mary Region. It is assumed that this region will become the main gas supplier in the next 15-25 years.

In West Turkmenistan, mainly associated gas is produced. Some of this production is exported mainly to Iran and partially to Russia[182]. The structure of exports is a bit complicated: the main buyer is Gazprom, but it resells most of Turkmen gas to RosUkrEnergo and Ukraine. Until 2006, the main importer of Turkmen gas was Ukraine.

In 2006, 89.8% of gas was exported by the CAC gas pipeline (built in Soviet times) to Russia and 10.2% was exported to Iran via the Korpeje-Kurt Kui pipeline (built in the late 1990s)[183]. Turkmenistan has long-term commitments to supply gas to Russia and Iran. Contracts for a period of 25 years have been signed – with Russia in 2003 and with Iran in 1995. The fierce competition for Turkment gas and the commitment of Gazprom to secure a leading role for itself can be illustrated by the agreed (at end-November 2007) increases in Turkmen gas prices for Gazprom (from USD 100/tcm in 2006 to USD 150/tcm in the second half of 2008).

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180 Туркменские виртуалии
http://www.ngv.ru/article.aspx?articleID=22565

181 Turkmenistan: A new president and a new phase of the Great Game;
http://www.osw.waw.pl/en/epub/EW/2007/070215/01.htm

182 Богатства кладовых «ГОЛУБОГО ТОПЛИВА». Газовая промышленность – «локомотив» экономики Туркменистана. Ахметджан НУРЫЕВ, 12.10.06;
http://www.turkmenistan.ru/?page_id=5&lang_id=ru&elem_id=8705&type=event&sort=date_desc

183 Turkmenistan. Presentation from experts of the Asian Development Bank. 2007

Trying to diversify and to develop export routes, the government is carrying out negotiations on gas pipeline projects (1) to Russia (a new gas pipeline for exporting Turkmen and Kazakh gas; or rather renovation of the existing branch of the CAC), (2) to China – the realisation of this project has started, (3) in the western direction (the trans-Caspian gas pipeline) and (4) to Afghanistan and then to Pakistan and India. Three of these projects do not appear very advanced according to available information. It is uncertain whether Turkmenistan has sufficient gas reserves to fill all these pipelines. Various stakeholders (governments of EU, Russia, China, India, Pakistan, Turkey, Azerbaijan and Georgia) have different interests in the respective options. The EU countries, China, India and Pakistan are interested in Turkmen gas as consumers, while Russia and Azerbaijan want to make money on transit. Turkey and Georgia have their own interests as they are both consumers and transit countries. Russia's interests are not restricted to its desire to make a profit from the transit of Turkmen gas. Along with this, Russia does not want to lose an important tool of influence on Central Asian countries and at the same time, wants to preserve its role as a monopolist supplier of gas reserves from the Caspian region to the European market. During his 2007 visit to the United States, the president of Turkmenistan said while addressing business circles: "I have heard of concerns about these projects. The most important concern is whether we will have enough resources to honour our obligations. I am answering: we will and what is more, we guarantee that our obligations will be honoured".[184]

Proved oil reserves are much more modest compared to gas reserves. Although extraction has been increasing at a slow pace in recent years, the volume of extracted and partly exported oil is not so significant in terms of influence on the foreign market. Oil is being extracted mainly in the west of the country (including Nebit-Dag, Kotur-Tepe and Barsa-Gelmes deposits, which are largely depleted by now)[185].

The Turkmen government has made repeated attempts to involve foreign capital in the exploration of promising deposits in the Turkmen shelf of the Caspian Sea and in a number of onshore deposits. More recently there are signs of increasing interest from the side of foreign companies. However, there are also obstacles that may limit the chances of their more substantial involvement. First, the general investment climate in Turkmenistan still is quite complicated and despite some improvement, there is a substantial degree of uncertainty as to future trends. Second, unlike in the Azerbaijani sector of the Caspian Sea, there was little exploratory work and no discoveries of major deposits in recent years. Third, infrastructure in the Turkmen sector of the Caspian Sea is underdeveloped and thus requires relatively higher investments than e.g. in case of Azerbaijan.

After Gurbanguly Berdymuhammedov's election as new president of Turkmenistan and changes in the domestic and foreign policy of the Turkmen leadership, we see rising interest from foreign companies/governments and can predict an inflow of investment. Improving prospects for cooperation have been confirmed by the strong presence of international actors (government and business) at the International Gas Conference in Ashgabat in November 2007.

Oil and oil products are exported by tankers to the Azerbaijani terminal in Baku and to the Iranian terminal Neka. From Baku, oil and oil products go to Georgia's Black Sea terminals by railway.

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184 Выступление Г. Бердымухамедова на встрече с бизнес-кругами. 26.09.2007; http://www.dogryyol.com/article/8075.html

185 Туркменистан. http://www.nefte.ru/oilworld/s2.htm

According to various estimations, from USD 10 to 60 billion for the period until 2020 are required for the development of Turkmenistan's promising oil and gas deposits[186].

There is a great number of promising onshore deposits, especially in the Amudarya basin (eastern Turkmenistan). The promising reserves of this region are estimated at 1,075 billion tonnes of oil and 1,765 bcm of gas[187].

A number of foreign companies are working in the oil and gas sector of Turkmenistan. Among them are Petronas (Malaysia), Maersk Oil (Denmark), Burren Energy (Britain), Mitro International (Austria), Dragon Oil (UAE-Britain), and CNPC. The government has signed production sharing agreements (PSA) with these companies. Foreign companies are not extracting a great amount of oil for the time being.

During the years of independence, the Turkmen government has also paid attention to the growth and reconstruction of the oil and gas processing sphere, which is currently represented by the Turkmenbashi complex of oil refineries, the Naip gas processing complex and the Seydi oil refinery.

Special attention is being paid to increasing liquefied petroleum gas (LPG, propane) production. It is exported mainly to Iran, Afghanistan and Pakistan. The Turkmenbashi complex of oil refineries and the Naip gas refinery have produced almost 2 Mt of LPG over the last five years[188]. Production capacities to produce LPG will increase and reach 2 Mt by 2020. The construction of a sea terminal has started in the port of Kiyanli to store and ship out LPG export flows. The commissioning of this facility, planned for February 2008, will make it possible to export LPG to the seaports of Caspian littoral states and then to Europe[189].

Over the last 15 years of the country's independence, the power sector of industry has seen dynamic development related first of all to an unprecedented growth in generating capacity. In 2006, the overall capacity of all power stations of the Turkmen Ministry of Energy and Industry totalled 3,311 MW. Compared to 1992, the growth in generating capacity totalled 912 MW. Power is generated at seven power stations: Ashgabat, Mary, Turkmenbashi, Abadan, Balkanabat, Seydi and Hindukush power stations[190].

Turkmenistan keeps increasing the capacity of the energy complex in order to meet the growing demand for electricity due to a growth in industrial production, construction and municipal services. For example, during the years of independence, power consumption increased from 8.8 to 11.6 billion kWh (the data sources differ here, e.g. EIA reports 7.5 billion kWh in 1994, declining to 4.6 billion kWh in 1998 and returning to 7.1-7.6 billion kWh during 2002-2005).

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186 Богатства кладовых «ГОЛУБОГО ТОПЛИВА». Газовая промышленность – «локомотив» экономики Туркменистана. Ахметджан НУРЫЕВ, 12.10.06; http://www.turkmenistan.ru/?page_id=5&lang_id=ru&elem_id=8705&type=event&sort=date_desc

187 Туркменистан. http://www.nefte.ru/oilworld/s2.htm

188 Богатства кладовых «Голубого топлива». Газовая промышленность – «локомотив» экономики Туркменистана. Ахметджан НУРЫЕВ. 12.10.06; http://www.turkmenistan.ru/?page_id=5&lang_id=ru&elem_id=8705&type=event&sort=date_desc

189 Ibid

190 Новости страны – электроэнергетика наращивает мощности; http://www.sofreco.com/projets/c886/Newsletters/TUR_news-letter6_aug%202006.pdf

Electricity generation exceeds domestic production and the surplus is exported – mainly to Iran and Turkey, with some flows to Afghanistan as well[191].

Foreign companies (American General Electric and Turkish Calik Energy[192]) are also taking part in the development of power generation.

The importance of the energy sector in the economy

The energy sector certainly plays a leading role in the economy. A significant part of export income comes from the sale of natural gas, oil and oil products, as well as in small volumes from electricity and LNG. Unfortunately, confidentiality of information makes it impossible to carry out a substantial and comprehensive analysis of the role of the energy sector in the country's economy. According to a recent statement by the director of the Turkmen Institute for Geology, it turns out that 85% of GDP is created in the oil and gas sector, which is most likely a major overestimation. From other sources, revenues from energy export cover almost 75% of the state budget. Certainly, public sector revenues are largely from oil and gas incomes, but the complication is that these are not incorporated in the budget. The management instead rests with the president. These off-budget funds go unreported in the official statistics.

Thus, the country's gas export affects everything: growth in GDP, the development of commodity production, the social sector and foreign policy[193].

Key macroeconomic issues related to the energy sector

Turkmenistan used to be one of the least free economies of the world with the very little scope for market forces to work. The change of the country's leadership initiated some changes. There is however still not sufficient information to judge the importance of planned or already implemented reforms and policy changes.

Confidentiality of information does not make it possible to carry out an analysis of the influence of the energy sector on the macroeconomic situation in the country. Statistical information is limited and largely treated as confidential, while international financial institutions have access only to indirect information.

The non-oil fiscal deficit is probably large – ADB reported it at 9.5% of GDP in 2005[194].

Public sector revenues are largely from oil and gas incomes that are off budget, and these are managed with other funds directly by the president. These off-budget funds go unreported in the official statistics.

It is therefore not possible to present here a meaningful analysis of macroeconomic challenges (very likely quite serious – e.g. related to quasi-fiscal operations such as free electricity, gas and

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191 Туркменистан. Презентация экспертов Азиатского Банка Развития. 2007

192 Turkish company leads in reconstruction of Turkmen power plants; http://www.gasandoil.com/goc/company/cnc25093.htm

193 Туркменские виртуалии. Сергей Смирнов, Независимый обозреватель, Казахстан; http://www.ngv.ru/article.aspx?articleID=22565

194 See http://www.adb.org/Documents/Books/ADO/2007/TKM.asp

water provision to households[195]) that are related to the dominant position of the energy sector in the economy and the modes of its functioning.

The role of the state in the energy sector

The state plays a leading role in the energy sector. In the oil and gas sector alone, part of services – about 10% – are made with the participation of foreign companies. The state has a 100% monopoly on the electricity sector. Because of the low domestic prices for electricity (the population is completely exempted from paying for electricity), it will be hardly possible to attract foreign investments, even if the government wanted to do so. General Electric and Turkish Calik Energy, which we mentioned earlier, have participated in modernizing Turkmenistan's energy capacities on an instruction from the country's government.

Other issues

Turkmenistan's gas reserves could play a certain role in diversifying the sources of this type of natural resource for European countries. The Nabucco project relies mostly on Turkmen gas. This will require the construction of a trans-Caspian gas pipeline or gas pipeline via Iran to Turkey. First of all, it will be necessary to ensure a considerable growth in gas production. But the amount of gas is not enough to keep all Turkmen promises to Russia, China, the EU, Afghanistan, Pakistan and India. Nevertheless, the discovery of the previously mentioned gas deposits in 2006-2007 and optimistic forecasts about enormous gas reserves in the country opens a new chapter in the great Turkmen gas game. This is also furthered by the actions of the country's new leader aimed at turning Turkmenistan into an important participant in the gas market.

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[195] See http://www.turkmenistan.gov.tm/?idr=2&id=071023a

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Ukraine

by Ivan Poltavets

Summary & SWOT

GDP (current USD billion)	140.5	Average annual GDP growth 2000-2007, %	7.5
Population, million	46.1	GDP per capita (USD at PPP)	6941
Total Primary Energy Supply (TPES), Mtoe	143.2	TPES/GDP, Mtoe / 000 USD, base year 2000	3.17

SWOT analysis: Ukraine

Strengths	**Weaknesses**
Location as a transit country Geographical proximity to its primary energy supplier Established electricity network Ample gas storage facilities Established gas transit network Established oil transit network Ability to create closed nuclear cycle Export refining capacity	Unfavourable investment climate in the energy sector Very heavy dependence on Russia as a supplier of primary energy and as a transit route for Asian gas Aging physical infrastructure Weak legislative and regulatory framework Limited commercial focus of state enterprises in the sector Nontransparent mechanism of gas supplies to Ukraine Weakening financial position of Naftogaz (lost industrial consumers of gas - the profitable part of internal gas market)
Opportunities	**Threats**
Increased production of domestic resources (primarily coastal extraction of gas and oil) Diversification of energy supply sources Expanded transit activities and increased transit revenues Private sector participation	Disruption in energy supplies from Russia (particularly gas) Higher energy import costs Unpredictable imported energy pricing Deterioration in service quality Further deterioration of the domestic infrastructure Low energy efficiency Pressures on fiscal revenue streams as a result of explicit and implicit subsidies Loss of control/influence on gas transit (while transit potential is one of the main assets of Ukraine)

Ukraine has one of the most energy-intensive economies in the world, partly due to the strength of the steel and chemical sectors relying on under-priced energy inputs. It produces substantial volumes of natural gas and small volumes of oil and strongly relies on hydrocarbon imports from Russia or through Russian territory. At the same time it is a major transit corridor for Russian gas (and to a lesser extent for oil) sales to Europe (with shares of around 80% and above 15%, respectively).

Ukraine is a large net importer of energy resources, particularly of natural gas. It is the fifth largest natural gas consumer in Europe and despite substantial domestic production (slightly below Kazakhstani levels in 2006) it is a major importer of natural gas from Russia and Turkmenistan (with Gazprom-controlled intermediates). The terms of gas imports and gas transit have been subject to continuous bargaining between Gazprom and Ukraine, involving political negotiations at the highest levels and disagreements, occasionally leading to short supply interruptions. These relations are highly non-transparent. In particular, the role of intermediaries such as RosUkrEnergo, partly controlled by Gazprom, which accounted for the bulk of Ukrainian gas imports originating in Turkmenistan, raised several doubts. Since 2006, import prices for natural gas have increased substantially.

Oil plays a limited role in the energy balance, with a share of less than 15%. Seventy-five percent of this is imported, mainly from Russia. The refining sector has been privatised with Russian companies strongly involved]. Several refineries are currently being modernised to improve product quality.

Ukraine has a large power generating capacity (almost twice the domestic demand) and exports electricity to Russia and EU countries. Exports to the EU are limited by the fact that Ukraine's power grid is not connected to the UCTE system and is synchronized with Russia's system. Besides, the transmission and distribution systems are in need of investment and maintenance.

Energy production, consumption and exports / imports – key data & key players

	1990	1995	2000	2006	Source
Gas production (bcm)	26.2	17	16.7	19.1	BP (2007)
Gas production (bcm)	28.1	18.2	17.9	20.1	Ukrstat
Domestic gas consumption	127.8	81.3	73.1	66.4	BP (2007)
Electricity production (billion MWth)	298	194	171	193	Ukrstat
Coal production (Mt)		57 (1996)	62.4	80.4	Ukrstat
Oil consumption (refineries), Mt	58 (1991)	16	8	14.3	Ukrstat

Key players in the energy sector

Oil:

Ukrnafta (50%+1 belongs to NAK "Naftogaz Ukrainy", the rest private)

JV "Poltavska gazonaftova kompanija"

Ukrtransnafta, TNK-BP, operates the Odessa-Brody pipeline

Natural gas extraction:

Ukrgazdobycha (state-owned, part of the NAK “Naftogaz Ukrainy”, responsible for most of the gas extraction in the country)

NAK “Nadra Ukrainy” (state-owned)

- gas import: RosUkrEnergo (50% Gazprom, 50% private)

- gas transit and storage: Ukrtranshaz

- gas distribution:

NAK “Naftohaz Ukrainy” (state-owned, supplies households)

UkrGazEnergo (50% RosUkrEnergo, 50% Naftogaz; supplies industrial customers, controls almost 75% of the market)

Refining – the largest refineries:

Kremenchug NPZ (Tatneft controls de facto 55%)

Lysychansk NPZ (TNK-BP)

Kherson NPZ (majority shareholder Kazakhoil, manager – Aliance Group)

Transportation of energy resources / electricity:

Ukrtransgaz (state-owned, part of the NAK “Naftogaz Ukrainy”)

Ukrtransnafta (state-owned, part of the NAK “Naftogaz Ukrainy”)

Ukrenergo (state-owned, power transmission networks)

Electricity generation:

NAEK “Energoatom” (100% state-owned)

OJSC Dneproenergo (50+1% state-owned)

OJSC Tsentrenergo (state-owned, limited private ownership)

Selected facts on the energy sector

Ukraine is a large consumer of natural gas. Domestic production only covers approximately one-third of domestic demand. There are opportunities to expand gas extraction – reserves discovered up to 2005 amount to 1024 bcm[196]. However, more than 15% of gas reserves are hard to develop because of the geological conditions. The Energy Strategy 2030 foresees an increase of yearly gas extraction from 20.8 bcm in 2006 to 28.5 bcm in 2030. The focus is on the Black Sea shelf, however, a lack of technologies and investment resources inhibit domestic companies from undertaking the task. This unfavourable investment climate and lack of a clear-cut political

196 Energy strategy for Ukraine 2030.

decision on allowing foreign firms to participate in gas extraction prevents development of new sites.

Oil is significantly less important in the total energy balance, covering less than 15% of the overall primary energy consumption. Domestic oil production covers about 25% of consumption. Out of 14.3 Mt processed by Ukrainian oil refineries in 2006, 3.6 Mt (i.e. about 25%) came from domestic sources.[197] The rest of the oil was imported from Russia. Attempts to diversify oil imports have failed so far. Most of oil refining capacity is owned by Russian corporations, who are not interested in diversifying their import structure. As of 2005 oil reserves were estimated at 116 Mt. Oil extraction is expected to increase only slightly up until 2030 (from 4.5 Mt in 2006 to 5.4 Mt).

Electricity production in Ukraine comes from three major sources: nuclear (42% of total electricity production in 2006), thermal power plants (coal- and gas-fired) (48%), and hydropower plants (6%). Other types of generation capacity account for 4% of total production.[198] While nuclear power stations capacity is fixed, electricity production in Ukraine is rising due to the thermal power plants.

Coal plays an important role in the primary energy supply in Ukraine. About 30% of electricity is produced from domestic coal by thermal power plants[199]. With gas prices growing, gas is being substituted by coal, wherever such opportunity exists. Known reserves of coal in Ukraine are at a level of 52.6 billion tonnes. Coal extraction has been relatively stable over the last years. In 2006, it reached 80.4 Mt, about 3% higher than in 2005. Coal quality remains an issue. There are plans to raise production to 90 Mt annually, but lack of investments makes realisation of them unlikely.

Government pricing policy in the gas sector acts as a barrier for domestic gas producers to become exporters: prices of domestic gas are fixed with the help of the “cost plus” method and the gas itself should be sold below market prices, primarily to households. This arrangement does not allow companies to afford gas extraction expansion and leads to stagnating gas production. Although this concerns only state firms, there is a risk that gas extracted in Ukraine may be difficult to sell or to export. Until now, there are no viable plans to raise prices for domestically extracted gas. There is almost political consensus that gas extracted in Ukraine by state firms should be sold to households at cost-covering levels and not at competitive market prices. Procedures for access to the transit pipeline are not clearly defined and private extraction companies remain on the fringe.

Electricity exports increased by 25% between 2005 and 2006, reaching 10 mln kWh. The figures for exports are hard to compare due to their volatility: for instance in 2005 electricity exports to Russia stopped in the second half of the year and resumed only in November 2006. The main destinations of electricity exports in 2006 were Hungary (33.8%), Belarus (24%), Moldova (23.7%), Poland (8.5%), Russia (4.8%), Slovakia (4.8%) and Romania (0.5%). Electricity exports from Ukraine are restricted by the lack of proper connection to the European grid. Ukraine is not connected to the UCTE network and thus cannot easily expand its exports. Investment into inter-

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197 Інформаційна довідка про основні показники розвитку паливно-енергетичного комплексу України за грудень та 2006 рік.

198 Ibid.

199 48% of electricity is produced in gas and coal fired turbines. Gas and coal are used in a 1:3 ratio when converted to primary energy.

country grids requires funds lacking in the state coffers. It is likely that private capital will step in to construct inter-country connective grids (e.g., Emfezs will form a joint-venture with Ukrenergo to construct the South Ukrainian power plant – Isakcha connection). There are plans to privatize thermal power plants and oblenergoes (electricity distribution); however, privatization is constantly put off due to political uncertainty.

Ukraine is a net importer of nuclear fuel, gas and oil. Nuclear fuel comes mainly from Russia, for Ukraine lacks the capacity to utilize its reserves of uranium ore (estimated at 40,000 tonnes, i.e. about 150 years of consumption at the current rate). The plans to create a closed nuclear cycle in Ukraine are stalled by a lack of financial resources as well as by international political concerns. Creation of a closed nuclear cycle is part of the Energy Strategy 2030.

Oil is imported from Russia (around 75% of total refineries' consumption). Imports of oil from Russia dropped by 27% from 2005 to 2006. This is mainly explained by government interference in the petroleum market. Although the oil sector is one of the most liberalized, the government has pressured the producers to keep the petroleum prices stable through temporary bans on oil and oil products exports. This resulted in a significant drop in oil refining, large part of which was oriented towards exports.

An area of major risks is gas imports. Rising gas prices pushed Gazprom to review the gas price for Ukraine in 2006. Senior Gazprom officials have publicly promised to close the gap between the European and Ukrainian prices by 2011. However, no clear-cut schedule of price-increases has been worked out, leaving the price increases up to yearly negotiations. This state of affairs creates risks for businesses unable to account for gas prices in the medium term.

RosUkrEnergo supplies Ukraine with gas from Central Asia. However, this gas is sold to RosUkrEnergo according to contracts with Gazprom subsidiaries, provided that the Central Asian gas has been contracted by Gazprom. Therefore the price of gas for Ukraine depends on both Gazprom (provides contracted volumes of gas and transit capacity through Russian territory), and on Central Asian countries. The prices of gas from Central Asia are expected to rise. Although at the moment Central Asian states are barred from access to final consumers through Russian territory, with the construction of a gas pipeline from Turkmenistan to China this situation may change. At the moment Ukraine has no strategy to cope with rising gas prices. Gas price shocks are passed on directly to consumers. Understanding the prospect of future gas price hikes, industrial enterprises have started to invest massively in energy saving and gas substitution technologies. Forecasting the impact of gas prices is difficult due to the poor quality of Ukrainian data and substantial shadow economy. For instance, a general equilibrium model expects a significant drop of GDP growth due to the rising gas prices. However, notwithstanding the shock Ukrainian economy continues to show a fast pace of growth.

The scheme of imports of Central Asian gas into Ukraine is not transparent. RosUkrEnergo, 50% of which is owned by Gazprom and 50% by private (mostly Ukrainian) investors, is a monopolist importer of gas. It receives gas contracted out by Gazprom in Central Asia and sells it to Ukrgaz-Energo (50% owned by RosUkrEnergo and 50% by NAK "Naftogaz Ukrainy". RosUkrEnergo's role is constantly questioned both by Ukraine and by Gazprom representatives. Technically all the profits of the importer could go to Gazprom. Intermediary importers played a role in the Russian-Ukrainian gas relations for a number of years (Itera, EuralTransGaz, RosUkrEnergo). Today, no inter-governmental guarantees of gas supply exist, thus putting all responsibility for security of supply on RosUkrEnergo. Such an arrangement is diminishing the energy security of Ukraine.

Ukraine is a major transit route for Russian gas. It holds a well-developed network of gas pipelines totalling 37.1 thousand km (including 14 thousand km of pipelines 1020-1040 mm in diameter). Input of the system is 290 bcm and output is 175 bcm per year. In support of this infrastructure Ukraine has underground gas storage capacities with an active storage volume of 32 bcm. Volumes of gas transit through the territory of Ukraine were declining in recent years. The decline of the gas transit volumes was explained by the competition from the alternative gas transit pipeline Yamal that runs through Belarus. Back in 1998 the share of the Ukrainian transit system in the transportation of Russian gas to Europe was about 94%, while in 2002 it stabilized at 82% (121.4 bcm). In 2006 it transited 128.5 bcm, which is 3.8% lower than in the year before. About 30% of the gas pipelines in Ukraine are already 100% depreciated;, 60% have operated between 10 and 33 years. It is hard to determine the current real capacity of the Ukrainian transit system, since technical audits have not been released. Energy Strategy 2030 estimates the necessary investments into the Ukrainian gas pipeline system at a level of UAH 92 billion.

The state company NAK “Naftogaz Ukrainy” controls tariff policy on the transit route. The heavy tax burden and long history of cross-subsidizing domestic consumption with transit fee proceeds did not allow the transit operator to invest in capital renovation. Russian suppliers seek control over Ukrainian transit capacity, trying to create a consortium to manage the transit route. A Russian-Ukrainian consortium has already been created, but only for joint management of the newly build infrastructure. The consortium is to build the Bohorodchany-Uzhorod pipeline, which is supposed to increase the capacity of the Ukrainian transit system. However, whether this project will go through is unclear due to political instability and lack of investment funds. Apart from that, Gazprom is seeking to diversify the transit routes by building new pipelines.

Ukraine possesses an extensive network of oil transit capacities. The oil pipelines with a length of 4.6 thousand km have a capacity of 100 Mt of input and 70 Mt of output. Oil transit volumes have been on the decline due to Russia’s diversification of oil transit routes. In 2000 43.1 Mt were transited through the territory of Ukraine and in 2006 the volume dropped to 21 Mt. The transit pipelines are currently used at about 40% of their actual capacity, after taking into account aging of capital stock. Taking into account the heavy tax burden and low transit volumes, funds for capital investment are scarce. In 2001, the Odessa-Brody pipeline was built to transport light Caspian oil to Eastern and Central Europe. However, due to poor business planning the pipeline of 9-14 Mt throughput capacity was not extended to Plock (Poland) and is currently working in reverse mode, transporting Russian oil from Brody to Odessa. Extending the pipeline to Gdansk is still considered and Ukraine may use this pipeline in direct mode (from Odessa to Brody). Presently Ukraine lacks partners that could provide promises to supply oil for transport in the direct mode.

Ukraine heavily depends on energy supply from Russia. Supply of oil, gas and nuclear fuel is either directly from Russia or through Russian territory (Asian gas). Moreover, the opportunities for energy supply diversification remain limited. The price of gas in Ukraine is still lower than the competitive regional price, hence either construction of new pipelines, or of LNG terminals remains unprofitable. Russian oil remains to be the easiest source for oil refineries, most of which belong to Russian multinational companies. Attempts have been made to diversify the supply of nuclear fuel to Ukrainian nuclear power plants.

The power sector in Ukraine remains largely state-owned. Massive investments necessary to renovate the depleted capital exceed the capacity of the public coffers. The necessary capital could come from private sources, but privatization in the sector, after the sale of half of the distribution companies in 2000, is stalled. Debts of the enterprises, accumulated in 1997-1999 brought companies that generate electricity on the edge of bankruptcy. The state has placed a ban on bankruptcy procedures in the sector, but did not manage to solve the issue of debt restructuring.

The importance of the energy sector for the economy

The energy sector plays an important part in the economy of Ukraine. Its share accounted for 8.4% of GDP in 2005, with the largest contribution from the electricity sector (2.9%)[200]. Data on investments in the energy sector is incomplete. The investment data is readily available only for the state-owned part of the energy sector. In 2006 these enterprises invested UAH 6.3 billion, which was 1.5% higher than in 2005. Exports in the energy sector in 2005 were at the level of UAH 16.1 billion (7% of total exports), and imports – UAH 54.3 billion (24% of total imports)[201].

Key macroeconomic issues related to the energy sector

The main problems plaguing the energy sector are non-payments and debt burden massively accumulated by enterprises. Non-payments, mutual write-offs, non-cash payments were widespread in 1997-1999. Massive debts were accumulated during these years and then slowly continued to build up until today. After the year 2000 these practices ended, and the major source of debt accumulation in the sector is caused by non-payments from the final consumers. In 2006, the payment rate for the electricity supplied from the wholesale market reached 102.2%[202]. However, payments for gas by the final consumers in 2006 were at a level of 86.5% only. [203]

The volume of tax arrears in the energy sector is substantial. For a long time, it constituted around 70% of total tax arrears in Ukraine. The list of enterprises that are the biggest debtor of the consolidated budget is headed by NAK "Naftogaz Ukrainy", followed by other gas and coal extracting enterprises and energy generation companies. According to the Wold Bank data, in 2006 total tax arrears in the energy sector constituted more than UAH 10 billion, being about half the debts of the NAK „Naftogaz Ukrainy".

Quasi-fiscal activities represent a still important problem of the energy sector, although its significance is declining. The size of QFA in the energy sector went down from 7.4% of GDP in 2001 to 4.3% in 2005. This was possible due to improvement of payment discipline, a ban on barter, mutual settlements, a decrease in the volume of tax write-offs and a reduction of mispricing of energy resources.[204]

Adjustment to rising gas and oil prices is a burning issue with potentially large macroeconomic and microeconomic effects. For years, energy prices and public utility tariffs were kept below the costs of providing these commodities or services. Low gas prices did not provide the industry with incentives to invest in increasing energy efficiency. Hence, after the import price for Russian

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200 State Statistics Committee, Input-Output Tables 2005

201 State Statistics Committee, Input-Output Tables 2005

202 Інформаційна довідка про основні показники розвитку паливно-енергетичного комплексу України за грудень та 2006 рік.

203 Ibid.

204 Creating fiscal space for growth. Public expenditures review. World Bank. p. 74, paragraph 3.74

gas increased from USD 50 per tcm in 2005 to USD 130 per tcm in 2007 it was expected that the output of the steel and chemical industries would decrease. Industrial prices fully reflected the increase of the import price. However, favourable foreign trade conditions countered the trend of the rising gas prices and these sectors remained stable with only the chemical industry decreasing its profits. The main area of concerns related to the rapid adjustment of gas prices is the public utilities provision, namely heat supply to households. Rising gas prices led to a steep increase in the cost of heating for households. Against the backdrop of a badly crafted system of targeted social aid to poor households, rapid adjustment of public utilities bills led to a decrease in the payment rate. This in turn created a higher indebtedness of the public utilities enterprises for gas, leading to constant debt disputes with the gas suppliers.

There are plans to introduce market-pricing mechanisms for gas extracted domestically, to eradicate cross-subsidization of household's energy consumption by industry. However, the electoral cycle (presidential elections coming in 2009) does not allow realizing these plans, given that such a move would confront the electorate with a higher energy bill. These plans will essentially mean substitution of universal subsidy given to households through subsidized or non-market energy prices by targeted subsidies. So far no government risked pursuing such an unpopular policy and it is unlikely this will happen in the coming years.

The role of the state in the energy sector

The energy sector is one of the least reformed sectors of the Ukrainian economy with a relatively strong state involvement. Oil refinement has been liberalized with most refineries privatized. However, the government regularly pressures private producers and retailers to suppress price increases. The electricity sector is characterized a by mixed private and state ownership. Nuclear and hydropower plants are fully state-owned and most of the thermal power plants belong to the state. About half of the distribution networks was privatized and mainly owned through offshore companies. The state controls power distribution through NAK "Naftogaz Ukrainy". The National Electricity Regulatory Commission regulates distribution companies. The sector was vertically unbundled with distribution, generation and transmission legally separated. Until 2006 the natural gas sector was monopolized by NAK "Naftogaz Ukriany", a state energy holding, but after 2006 industrial customers are served by UkrGazEnergo, while households and public utilities receive gas through a subsidiary of NAK "Naftogaz Ukrainy". UkrGazEnergo is owned by NAK "Naftogaz Ukrainy" and RosUkrEnergo, monopoly gas importer to Ukraine, a joint venture of private individuals and Gazprom.

Since 2000 tariff policy has been moving towards full cost recovery. However, cross-subsidization and below cost tariffs still exist. Electricity and gas tariffs for households still do not cover the costs and capital investments. Electricity tariffs for households are cross-subsidized by the industry.

Other issues

The main issue for the coming years will be the yearly renegotiations of the gas price with Gazprom. RosUkrEnergo is a subsidiary of Gazprom and is de facto reduced to an operator of gas imports to Ukraine. Although it is clear that the price for Ukraine will adjust to the regionally competitive level, it is unclear how fast it will do so. The main determinant of the gas price rises for Ukraine is the price differential between the Ukrainian and European price, hence the foregone profits of gas sellers. This uncertainty represents a major drawback for the Ukrainian business climate, making it hard for the enterprises to engage in medium-term planning.

RosUkrEnergo's role in the future gas supply scheme is unclear, introducing another factor of uncertainty. However, the technical role of the intermediary implies that it may readily be substituted for another or completely withdrawn from the scheme. It is Gazprom that contracted out the Central Asian gas and thus removal of an intermediary is unlikely to bring adverse consequences to the gas trade.

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Uzbekistan

by Sabit Bagirov

Summary & SWOT

GDP (current USD billion)	22.3	Average annual GDP growth 2000-2007, %	6.3
Population, million	27.4	GDP per capita (USD at PPP)	2344
Total Primary Energy Supply (TPES), Mtoe	47.0	TPES/GDP, Mtoe / 000 USD, base year 2000	2.62

SWOT analysis: Uzbekistan

Strengths	**Weaknesses**
The presence of considerable gas, coal and uranium ore reserves The presence of considerable electricity generating capacity	Transit dependency on neighbouring countries The physical obsolescence of power and gas networks and high losses The low level of the diversification of energy sources and a near total dependence on gas
Opportunities	**Threats**
Increased production of gas The development of nuclear energy Increased trade with big Asian markets	Unfavourable transit conditions and prices offered by Russia to export Uzbek gas Difficulties of diversifying exports in connection with agreements signed with Russia Low level of foreign investors' interest due to delays in the democratization of the country

Uzbekistan has large gas reserves and for the last few years its gas output has been at levels similar to that of Turkmenistan, although exports have been much lower. A lack of economic reforms and an unfavourable investment climate have hampered the development of the energy sector.

Both a large domestic gas consumption and very high losses due to a deteriorated pipeline network do not currently allow any more significant increase in exports. Apart from gradually increasing exports to Russia, Uzbekistan has been supplying Kazakhstan, as well as Kyrgyzstan and Tajikistan (as part of an agreement with these neighbouring countries under which they operate their hydropower plants in the "irrigation mode", releasing water in summer that is needed for the Uzbek cotton growing industry; the agreement also involves electricity trade). Some increase in Uzbek gas exports is possible and the most likely direction of such additional sales would be to Russia.

Uzbekistan is a net importer of oil, with output stagnant or declining for the last few years. Foreign investors are present in only a few small upstream projects.

Gas is a key input in electricity production. Despite high nominal generation capacity, actual production is well below it, reflecting the ageing of many large plants and transmission lines and the need for extensive rehabilitation.

Energy production, consumption and exports / imports – key data & key players

	1990	1995	2000	2006	Source
Oil production (million tonnes)	2.8	7.6	7.5	5.4	BP*
Oil production (million tonnes)	2.8/1991**	7.6**	7.5**	5.4***	
Domestic oil consumption	12.6	6.8	6.7	6.9	BP*
Gas production (bcm)	38.1	45.3	52.6	55.4	BP*
Gas production (bcm)	41.9 (1991)**	48.6**	56.4**	62*****	
Domestic gas consumption	36.8	42.4	47.1	43.2	BP*
Gas exports				12.65******	
Coal production (million tonnes)	5.9/1991**	3.1**	2.5**		
Domestic coal consumption (million tonnes)			1.0	1.1	BP

Notes: * BP Statistical Review of World Energy June 2007, www.bp.com

** ТЭК России и стран Центральной Азии, http://www.eepnews.ru/publication/m4108

*** Основные экономические и социальные показатели. Статистическое обозрение Узбекистана

***** Узбекистан увеличит поставки природного газа Газпрому; http://www.gazprom-info.com.ua/145

****** Узбекистан увеличит экспорт газа до 14,5 млрд. кубометров. Заявление заместителя председателя "Узбекнефтегаз" Шавката Мажитова. 17.05.07; http://www.izvestia.ru/news/news135582/

Unfortunately, the websites of government agencies provide no official information to complete the above table.

Key players in the energy sector

The national holding company Uzbekneftgaz (http://www.uzneftegaz.uz/) is one of the major producers of fuel and energy resources in Central Asia and provides more than 60 bcm of natural gas and about 7 Mt of liquid hydrocarbon reserves per year. Moreover, the company annually produces 0.17 Mt of sulphur, and 0.125 Mt of polyethylene. The company is state-owned.

The Uzgeoburneftegazdobycha joint-stock company (Uzbekneftgaz subsidiary) carries out exploratory and exploitation drilling of oil and gas wells, is engaged in exploiting oil and gas deposits, in oil, gas and gas condensate extraction and in processing natural gas. There is a government decision to hand over to the company the Shurtan gas-chemical complex that produces polyethylene, liquid gas, light condensate, sulphur and gas.

The Uztransgaz joint-stock company (http://www.transgaz.uzneftegaz.uz/) (Uzbekneftgaz subsidiary) keeps gas in underground storages, manages natural gas transportation to domestic consumers and exports gas abroad.

The Uzneftprodukt joint-stock company (Uzbekneftgaz subsidiary) manages the assets of the Fergana, Altyaryk and Bukhara oil refineries of the republic, which refine oil and gas condensate and sell oil products on Uzbekistan's domestic market, own a network of oil bases, transshipment terminals and petrol stations.

The Uzbekenergo state joint-stock company (http://www.uzbekenergo.uz/) generates and distributes electricity.

The Uzbekugol joint-stock company is a leading manufacturer of coal in the country. It is part of Uzbekenergo.

The Navoi mining and metallurgical company is a producer of uranium.

Foreign companies such as Russia's Lukoil and Gazprom, Malaysia's Petronas Carigali Overseas, Korea's KNOC and China's CNPC and CNODC are also active in the oil and gas sector.

Selected facts on the energy sector

The volume of proven natural gas reserves at the end of 2006 was estimated at 1,870 bcm (BP data). Proven extractable oil reserves in Uzbekistan are estimated at 82 Mt. The possible hydrocarbon reserves (at the beginning of 2006) totalled: 1) natural gas – 5903 bcm, 2) oil – 818 Mt, and 3) gas condensate – 360 Mt[205].

Only natural gas is exported, while oil and condensate are consumed domestically. Gas exports (especially to Russia) have been increasing over the last few years and in 2006 they totalled 12.65 bcm (9.58 to Gazprom, 1.6 to Kazakhstan, 0.75 to Kirgizstan and 0.72 to Tajikistan[206]). The government is planning to double the volume of natural gas export by 2020, mainly due to development of new deposits by foreign investors.

Trying to ensure a growth in the extraction of hydrocarbon reserves, the government has signed agreements with a number of foreign oil companies on the exploration and development of promising deposits or on the intensification of the extraction of residual reserves at old deposits.

Of the total volume of foreign direct investments in Uzbekistan, about 30% fall to projects in the sphere of exploring and developing oil and gas deposits[207].

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205 Узбекистан подсчитал свои запасы природного газа. http://www.uzbekistanerk.org/modules.php?name=News&file=article&sid=2004

206 Узбекистан увеличит экспорт газа до 14,5 млрд. кубометров. Заявление заместителя председателя "Узбекнефтегаз" Шавката Мажитова. 17.05.07 ;http://www.izvestia.ru/news/news135582/

207 Объем освоенных иностранных инвестиций в Узбекистане превышает $20 миллиардов – президент Узбекистана. 26.01.2007 - Press-uz.info; http://www.cbonds.info/rus/news/index.phtml/params/id/360904; http://www.gov.uz/ru/ctx.scm?sectionId=106&contentId=2007

The Russian companies Lukoil and Gazprom are very active in the country's oil and gas sector[208]. Uzbekneftegaz national holding company and Gazprom signed an agreement on strategic partnership in the gas sphere in December 2002. The agreement provides for long-term purchase of Uzbek gas in 2003-2012, Gazprom's participation in projects in the sphere of natural gas extraction in Uzbekistan under a production sharing agreement, as well as cooperation in the sphere of developing Uzbekistan's gas transport infrastructure and transporting Central Asian gas through the territory of the republic. In 2004, Lukoil set up a joint operating company Lukoil Uzbekistan Operating Company on the Kandym-Khauzak-Shady-Kumgard project where 90% of shares belong to Lukoil and 10% to Uzbekneftegaz. The total reserves at these deposits exceed 280 bcm of gas, while the planned volume of investments is about USD 1 billion. Industrial gas extraction will start in 2007 and its buyer will be Gazprom[209].

Since 2004 also other investors have become more active in the Uzbekistan gas sector: the Malaysian company Petronas Carigali Overseas, Korea's KNOC, and China's CNPC. They have signed a number of agreements on exploration of the hydrocarbon deposits with Russian companies: Zarubezhneftegaz (Gazprom subsidiary) and the Gazprom open joint-stock company and Gas Project Development Central Asia AG (registered in Switzerland, but owned by two Gazprom subsidiaries).

A small amount of extracted natural gas is being used for producing LPG. In 2005, about 0.2 Mt were produced. Some of it is exported. The government intends to triple the production of LPG, increasing it to 0.615 Mt per year. At the Shurtan Gas and Chemical Complex, it is planned to construct a new factory worth USD 64 million with a capacity of 0.18 Mt of LPG and 0.1 Mt of gas condensate per year[210].

Natural gas is exported to Russia, Kazakhstan, Kyrgyzstan and Tajikistan. Most of the exports are sent to Russia. Starting in 2007, Uzbekistan is planning to supply 10 bcm annually to Russia alone. By 2014, it is planned to increase gas exports to 16 bcm and by 2020, to 20 bcm. There are even more ambitious plans to increase gas exports to 30 bcm and supply it to China as well, but whether this is realistic is unclear[211].

Beginning from 1 January 2006, Uzbekistan increased the price of gas exported to Kazakhstan, Kyrgyzstan and Tajikistan from USD 42 to 55 per 1,000 cubic metres. In 2006, Gazprom bought Uzbek gas for USD 60 and paid USD 1.1 for the transit of 1,000 cubic metres over 100 kilometres. On 1 January 2007, Uzbekistan increased the export price of gas to USD 100 for

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208 Узбекистан вынашивает планы развития энергетического сектора. Россия готова помочь. 18.02.2007, Сергей Благов; http://www.analitika.org/article.php?story=20070218083251 76

209 Российская Федерация и Республика Узбекистан: состояние и перспективы экономического и промышленного взаимодействия, *Н.С. Зиядуллаев - доктор экономических наук, профессор;* http://www.isatr.org/rus/analytic/zns003.shtml

210 "Нефтяные ведомости", http://www.neftevedomosti.ru

211 Осилит ли Узбекистан 30 миллиардов «кубов» газа на экспорт?; http://finance.rol.ru/news/article1653F/default.asp

1,000 cubic metres[212] for all importer countries (Russia, Kazakhstan, Kirgizstan, and Tajikistan[213]).

Uzbekistan's gas exports to Tajikistan and Kyrgyzstan also depend on Uzbekistan's demand for water resources in which these two countries are quite rich. In 1997-98, an idea was put forward and then an agreement was signed on setting up an international water-energy consortium with the participation of Kazakhstan, Kyrgyzstan and Uzbekistan (Tajikistan also joined the agreement in 1999)[214]. The idea of the consortium is that countries situated along rivers will carry out parity energy supplies for power stations of Kyrgyzstan and Tajikistan in exchange for these countries reducing the release of water from hydroelectric power stations in winter. For example, in order to generate electricity in the winter heating season, a great amount of water is released from the Kyrgyz Toktogul water reservoir, which Uzbekistan would prefer getting in summer for irrigation purposes. However, the consortium has not been set up yet.

The country's government has drawn up an energy saving programme, which would limit the annual consumption of natural gas in the country to 32 bcm by 2020[215].

In the case of increasing gas production, the export possibilities will also be held back by the throughput capacity of the physically obsolete gas transport system that was built in Soviet times. Uzbek gas is exported to Russia by the Central Asia-Center gas pipeline[216]. The Russian-Kazakh-Turkmen agreement[217] on the construction of a new Caspian gas pipeline and on the reconstruction of the Central Asia – Center pipeline, which was signed in May 2007, could enable increasing the volume of Uzbek gas exports to Russia as well.

The main growth in oil reserves occurred in the middle of the 1990s when the Kokdumalak deposit was discovered. Today, the country has enough oil reserves for 20 years. During the 1990s, oil production increased from 3.5 Mt in 1990 to 9.7 Mt in 1998. But in the following period, the volume of oil extraction steadily dropped and totalled 6.7 Mt in 2004. In 2006, only 5.4 Mt of oil were extracted. Most of the oil is consumed by three oil refineries – Fergana, Altyaryk and Bukhara. Uzbekistan was forced to start importing oil beginning from 2003.

Uzbekistan also has considerable coal reserves (proven coal reserves total 1.95 billion tonnes; the forecast reserves are estimated at 5.7 billion tonnes), but its extraction and use are still insignificant as they are not commercially viable. The share of coal in the energy balance is no more than 2% today. About 80% of all coal is extracted at the Angren deposit.

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212 Газпром будет покупать узбекский газ по $100 за тысячу кубометров; http://gazetasng.ru/chronology/business/?id=2390

213 Посол Узбекистана в Душанбе Шокасым Шоисламов выступил перед таджикскими студентами. May 03 2007; http://www.analitika.org/article.php?story=2007050300340632&mode=print

214 ВОДНО-ЭНЕРГЕТИЧЕСКИЕ ИНТЕРЕСЫ ТАДЖИКИСТАНА И КЫРГЫЗСТАНА; http://cawater-info.net/news/10-2006/27.htm

215 Мажитов Ш., Первый заместитель председателя НХК "Узбекнефтегаз". – «НХК "Узбекнефтегаз" на современном этапе развития и ее перспективы во взаимосвязи с энергетическим рынком в Центральной Азии", Международная конференция "Энергорынок Центральной Азии: тенденции и перспективы". - Ташкент, 6-7 декабря 2005 года.

216 http://www.eia.doe.gov/emeu/cabs/caspgrph.html

217 Цена победы; http://www.kommersant.ru/doc.aspx?DocsID=776134

Except for an insignificant growth in exports to Afghanistan, all extracted coal is consumed domestically. The main consumer of coal is the power generating sector which consumes about 90% of all coal.

The government is planning to invest USD 254 million in the development of the coal industry. About 90% of investments will be spent on the modernization of production capacity at the Angren deposit.

Uzbekistan is one of the 10 countries in the world that have large uranium reserves and the necessary production technologies and capacity. Proven reserves total about 65,000 tonnes, extracted at a price of USD 80 per kilogram, about 17,500 tonnes at a price of USD 80-130 per kilogram and 47,000 tonnes at a price of USD 130 per kilogram.

Uzbekistan produces about 7% of all uranium in the world. Russia is the main buyer of Uzbek uranium. However, after 1992, some of the extracted uranium was also exported to the USA through the American company Nukem Inc. Starting in 2007, Uzbekistan intends supplying uranium to Japan (on the basis of an agreement with the Japanese corporation Itochu signed in 2006).

Uzbekistan has a considerable power generating capacity (12.3 million kW as of 2006)[218]. In 2006, Uzbekistan generated 49.2 billion kWh and electricity demand is expected to rise to 64 billion kWh by 2015. Such a growth arises from the government's industrial policy and expectations that the rural population (presently 64% of the population) will move to cities.

Most of the generating capacity was created in the 1960s-70s. In this regard, power generation in Uzbekistan is facing serious challenges today. The main challenge is the high losses – estimated at 22-23%. About 75% of power is currently generated using natural gas.

According to preliminary estimations, about USD 3 billion of investments will be needed to develop the sphere of power generation until 2020-2025.

The importance of the energy sector in the economy

In 2006, industry accounted for 22.1% of GDP, up from 14.2% in 2000[219]. Over the last years, growth of output of the energy sector was slower than the industrial production index. Still, in the first half of 2007, fuel industry and electricity accounted for 27%[220] of the volume of industrial production.

Since the mid-1990s energy efficiency has started to improve. Energy intensity declined from 0.96 kg of oil equivalent/USD in PPP in 2000 to 0.86 in 2004. Electric power intensity decreased in the same period from 0.9 kWh/USD 1 of GDP at PPP to 0.8[221]. Sill, the energy intensity of the economy is very high, well above levels typical for developing countries.

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218 http://www.uzbekenergo.uz/rus/o_sovremennom_sostoyanii_i_pesrpektivax_razvitiya_energetiki/

219 Обзор макроэкономики и рынка ценных бумаг Узбекистана за 2006 год. DeltaMaxCapital; http://www.deltamax.biz/userfiles/pdf/uzb_annual_report_06.pdf.

220 Основные экономические и социальные показатели. Статистическое обозрение Узбекистана

221 Аналитическая записка. №1(8), 2007. UNDP, page 16; www.undp.uz/download.php?type=publication&id=68&parent=1540&doc=5579

According to the IMF[222], "Real GDP growth was high, the external current account surplus was large, and official reserves continued to rise. These developments have been supported by a favourable external environment, cautious fiscal policy, and gradual progress in structural reforms.". The rise in prices for exported gas played a significant role in increasing the country's revenues from foreign trade in 2006. In 2007, revenues from gas exports will increase mainly because beginning from this year, Gazprom is buying Uzbek gas for USD 100 for 1,000 cubic metres. Last year the price was USD 60. Overall, the share of fuel in the volume of exports in 2006 accounted for 13.1%, and in the first months of 2007 it increased by a few percentage points[223].

The share of the energy sector in foreign investments and credits accounted for 18.4% in 2006. The share of foreign investments accounted for 19% of the overall volume of investments in 2006[224].

Key macroeconomic issues related to the energy sector

Very low domestic prices of energy probably lead to substantial quasi-fiscal operations of the energy sector. No details are available on this or other macroeconomic impact related to the mode of functioning of the energy sector.

The role of the state in the energy sector

The energy sector almost completely remains in state ownership and is regulated with administrative methods. The government has a monopoly on the regulation of prices for energy and on the production and distribution of energy, and controls pipelines and power grids.

The policy of privatization in the sector was not effective because (1) it was only restricted to a small number of enterprises of secondary importance, (2) limited financial resources of domestic investors and (3) it proved impossible to win the confidence of foreign investors, partly because the government regulates prices.

The insignificant scale of privatization is also proved by the low level of deals on the stock exchange (0.47% in 2006[225]) with oil and gas shares in comparison with other sectors of the economy.

The existing system administrative regulation of prices does not ensure a sufficient level of capital return, which is why the sector is not attractive for investors. The policy of cross-subsidies and regulated prices for electricity and fuel, coupled with a low paying discipline and the lack of commitment to energy saving, has brought about a difficult situation for the energy sector, which might have a negative impact on the pace of economic growth. Even regular price hikes of recent years did not help improve the financial situation of energy companies to the extent that is needed for sustainable operation in the long-term.

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222 Republic of Uzbekistan: 2006 Article IV Consultation—Staff Report; http://www.imf.org/external/pubs/ft/scr/2007/cr07133.pdf

223 Основные экономические и социальные показатели. Статистическое обозрение Узбекистана. 2006

224 Основные экономические и социальные показатели. Статистическое обозрение Узбекистана. 2006

225 Обзор макроэкономики и рынка ценных бумаг Узбекистана за 2006 год. DeltaMaxCapital

The historical tariff structures made investments in the electricity sector largely unattractive. The situation was somewhat better in the oil and gas sectors where profit margins remained at 12-14%, leading to relatively larger investments, including some foreign investments. However, even here the picture is not rosy. One of the main reasons is state control over prices.

Other issues

The prospects for the development of the country's energy sector are mainly related to the involvement of foreign investments. To this end, the government creates conditions that are more favourable for companies that develop and explore mineral resources. They are exempted from all types of tax and customs duties for the period of exploration work, are given the exclusive right to carry out exploration work in a certain territory location in order to develop any deposit found there by setting up a joint venture on conditions of concession or production sharing. According to the founding documents of the joint venture or the concession agreement, they have the right to take without hindrance some of the hydrocarbon resources and their products out of the country on a tolling basis. They are given a guarantee that their expenses on exploration expenses will be reimbursed if they discover deposits of industrial value and if they are handed over to the Uzbekneftegaz national holding company for further development. Oil and gas extracting joint ventures that are set up with foreign companies and carry exploration work for oil and gas are exempted from the income (profit) tax for a period of seven years from the start of oil or gas extraction. When this period expires, the rate of the income (profit) tax at these joint ventures is established at 50% of the current rate. There are also other privileges[226]. However, the attractiveness of all these privileges is sharply reduced by the general business climate in the country, problems of currency convertibility, the underdevelopment of the banking system, state regulation of prices and other factors.

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[226] Инвестиционный климат; http://www.mfer.uz/MFERIT/invklimat.htm

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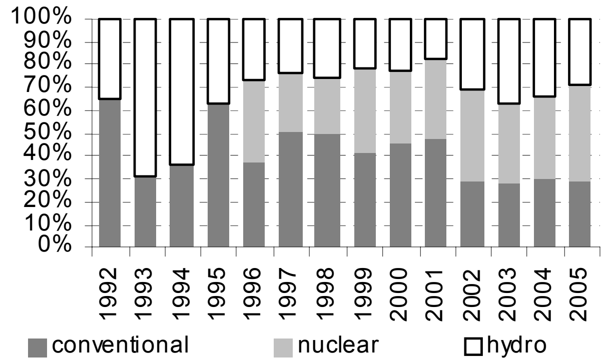
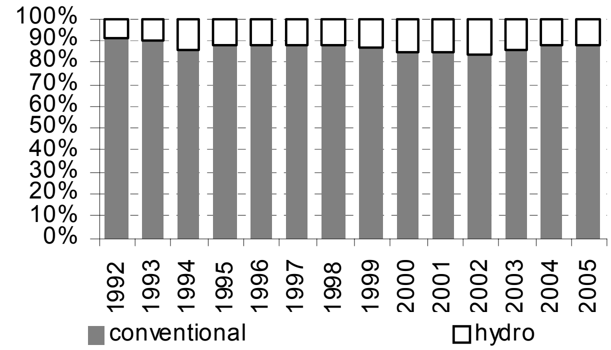
(ICG), посвященной экономическому положению в Узбекистане, 2004
http://www.analitika.org/article.php?story=20051102005440875

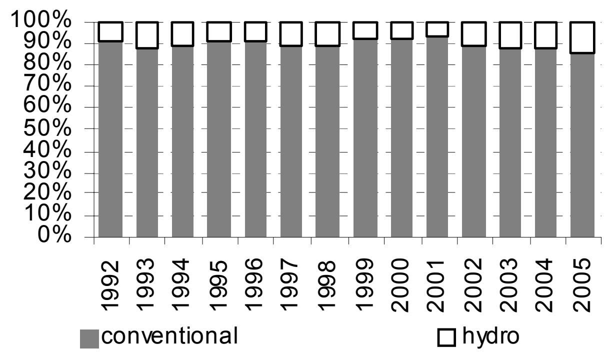
Appendix 2. Structure of electricity generation in CIS countries, 1992-2005



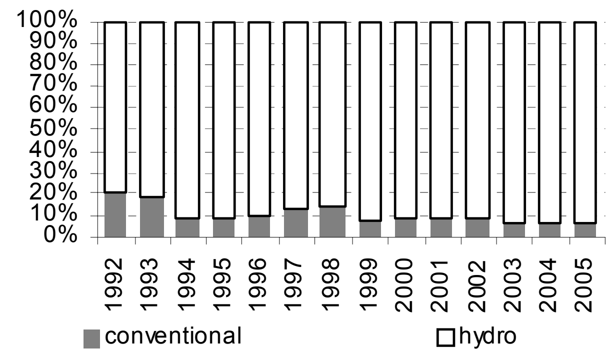
Armenia



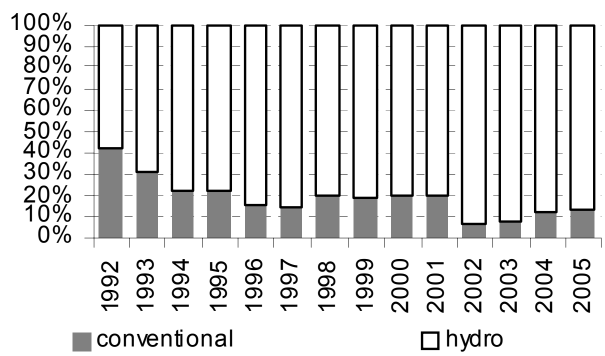
Kazakhstan



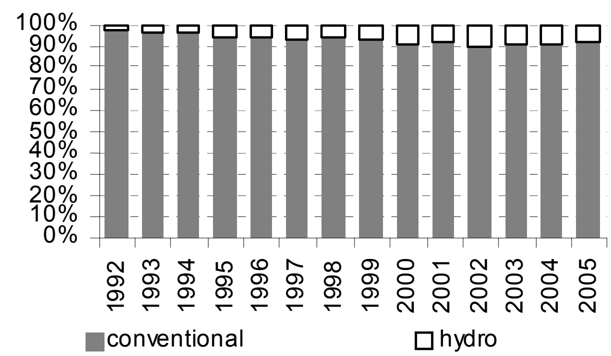
Azerbaijan



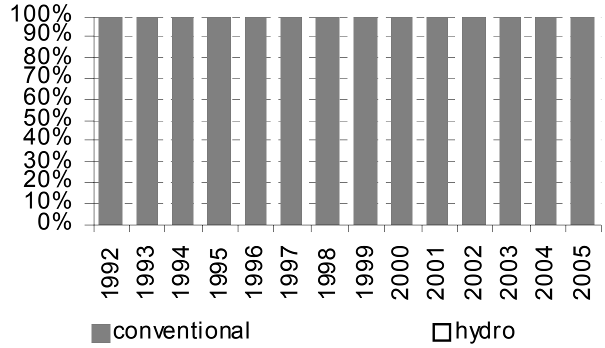
Kyrgyzstan



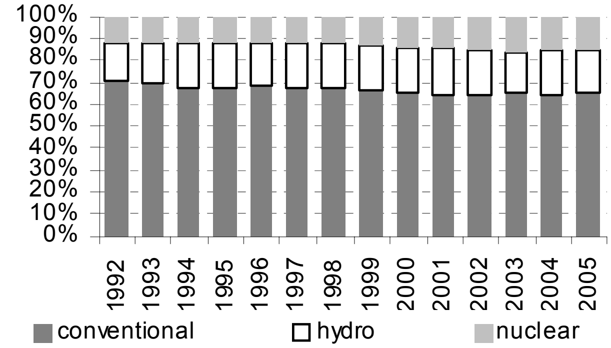
Georgia



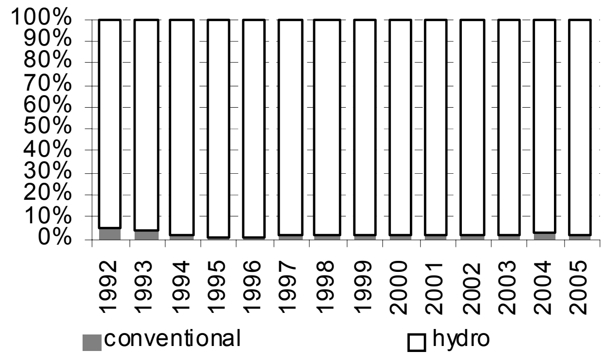
Moldova



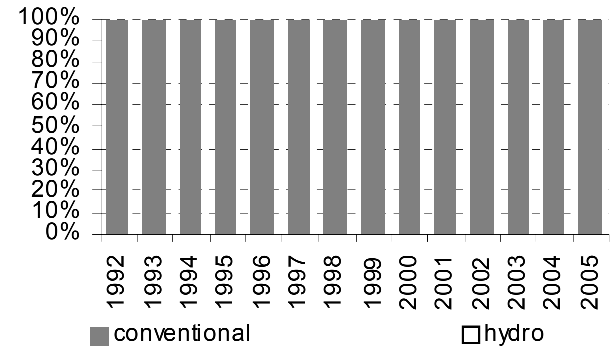
Belarus



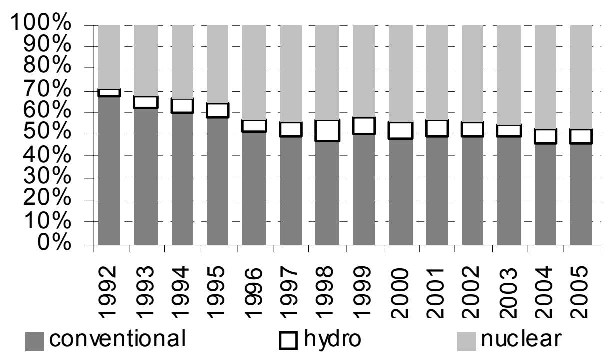
Russia



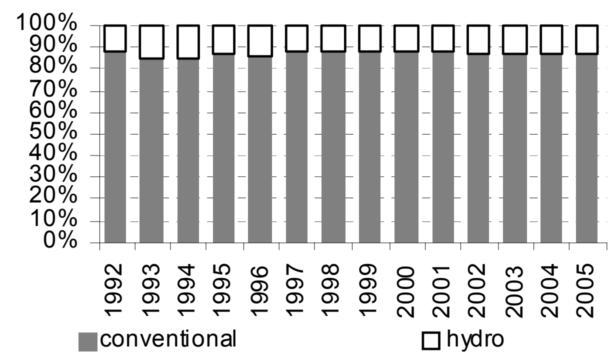
Tajikistan



Turkmenistan



Ukraine



Uzbekistan

Source: Energy Information Administration, USA.

Appendix 3. Background material for section 4.3

This annex contains additional graphs, tables and more technical model details related to Section 4.3 of the report, i.e. analysis of the Dutch Disease mechanisms in CIS countries.

Figure A4.3.1 The relative price of non-tradable goods – CIS

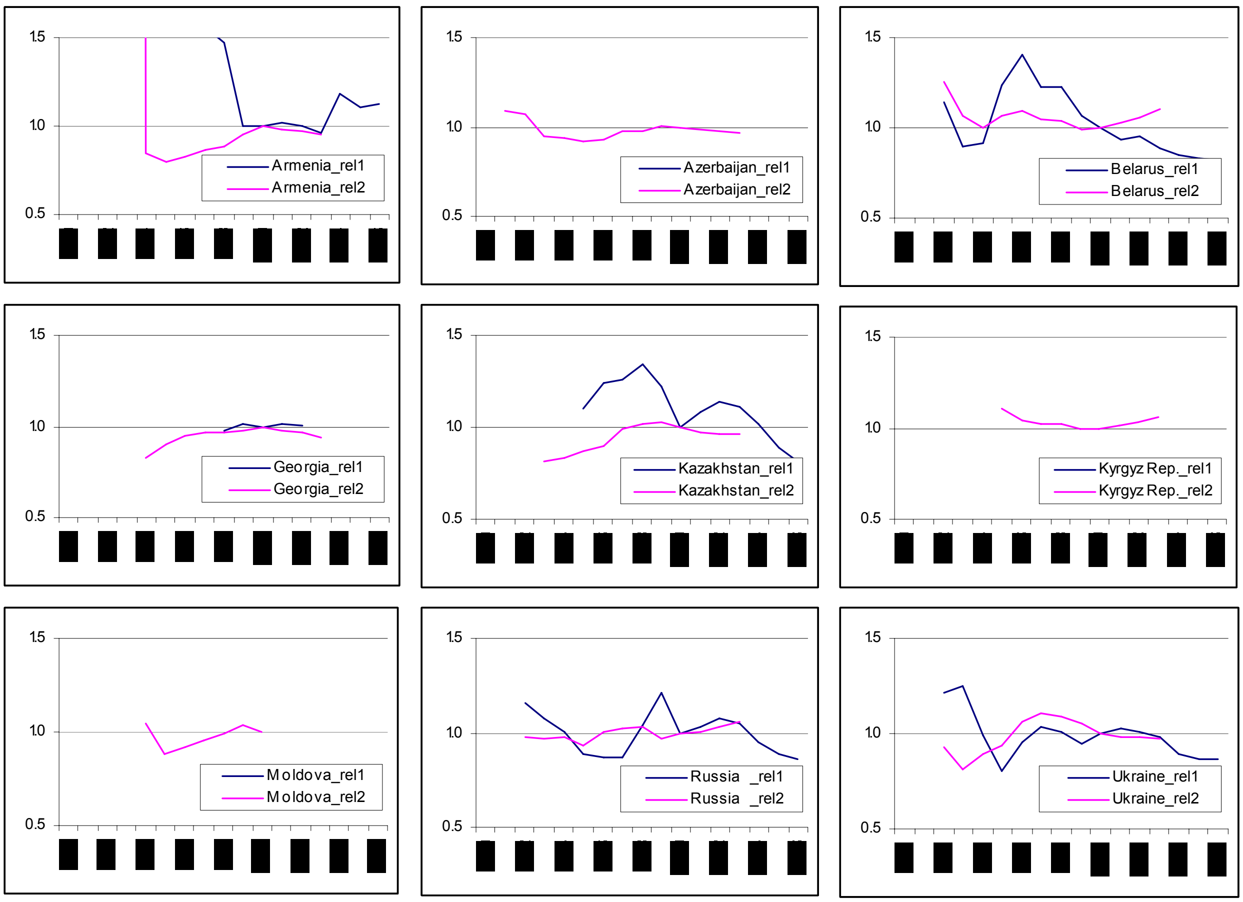


Figure A4.3.2 The relative price of non-tradable goods – CEE-5

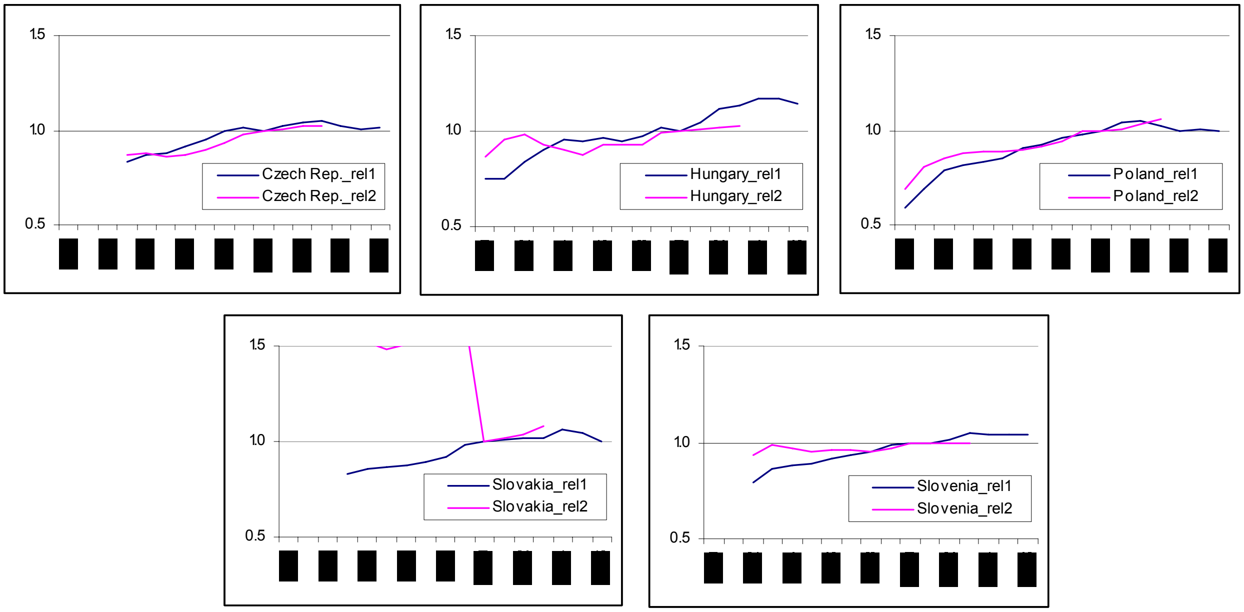


Figure A4.3.3 The relative price of non-tradable goods – Baltic countries

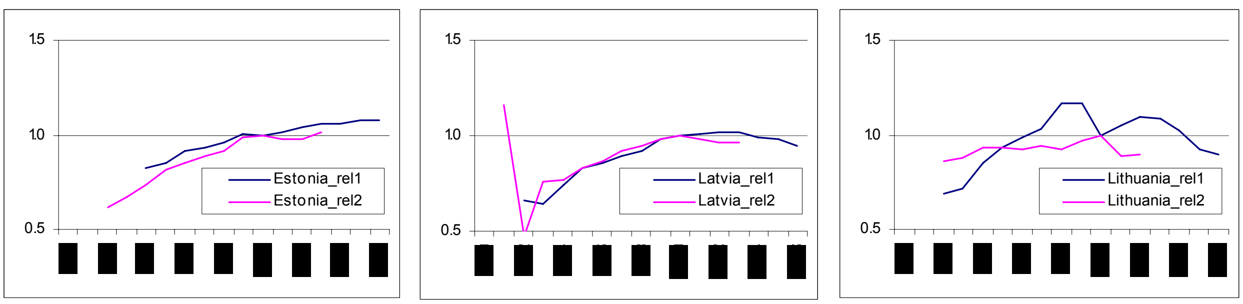
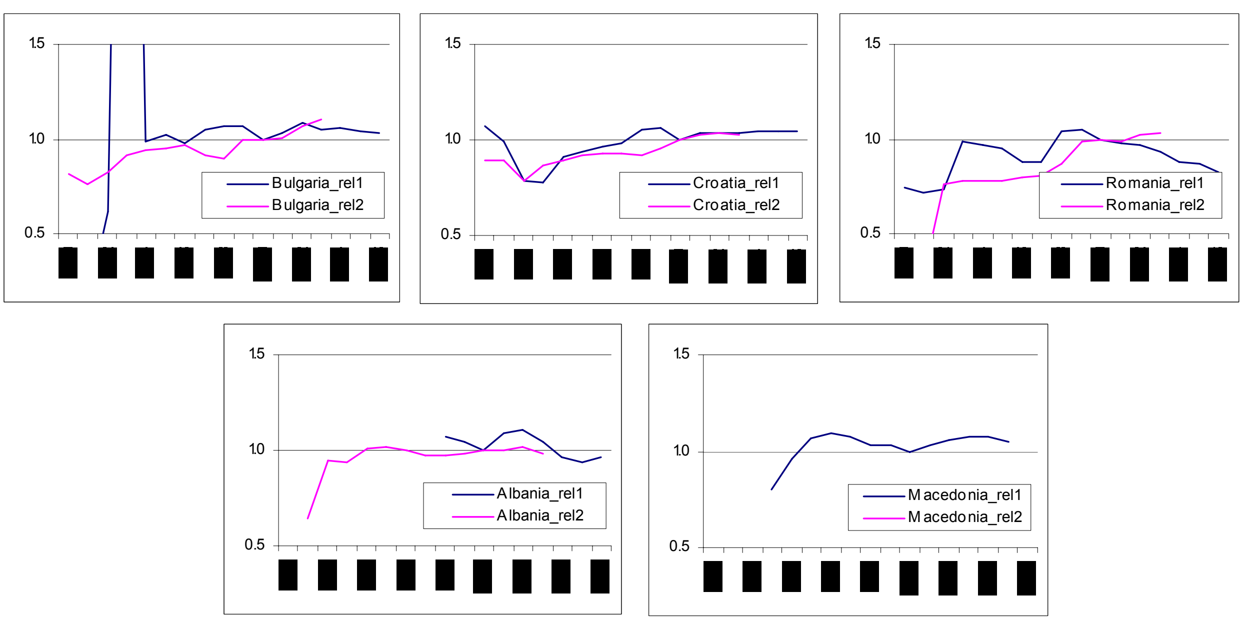


Figure A4.3.4 The relative price of non-tradable goods – South Eastern Europe



Commodity Prices and the Exchange Rate

The literature on exchange rate economics provides two straightforward ways to get a grasp on the effect of commodity prices on the exchange rate. First, commodity prices can be incorporated in a standard monetary model of the exchange rate. Second, real commodity prices are a commonly used indicator of terms of trade shocks and used in real exchange rate models. Let us review briefly how exactly commodity prices can be considered in these two approaches.

The Monetary Model and Commodity Prices

The standard monetary model relies on a two-country framework in which each country produces one (tradable) good, has its own money and bond that are perfectly substitutable. Standard money demand functions for the domestic and foreign economies are the first building block of the model that combined with the assumptions of purchasing power parity (PPP) holding for the whole economy ($e_t = p_t - p_t^*$) and of demand equalling supply on the money market ($m_t^D = m_t^S, m_t^{D*} = m_t^{S*}$) helps us express the nominal exchange rate as a function of money supply, income and interest differential across the home and foreign economies:

$$e_t = m_t - m_t^* - \beta_1(y_t - y_t^*) + \beta_2(i_t - i_t^*) \qquad (1)$$

where e_t is the nominal exchange rate, expressed as units of domestic currency per one unit of foreign currency[227], m_t and y_t are money supply and real income and i_t denotes the interest rate. The interest rate can stand for the returns on financial assets included in the definition of money, i.e. the own rate of money (i_t^{OWN}). But it can also stands for the opportunity costs of holding liquid assets, i.e. returns on financial assets not included in the definition of monetary aggregates (i_t^{OUT}). If a narrow definition of money is used, i_t^{OWN} is zero and i_t^{OUT} can be both short-term and long-term interest rate. If one considers a broader definition of money, short-term interest rates capture i_t^{OWN}, while long-term interest rates are more appropriate for i_t^{OUT}.

Small letters denote – here and in the remainder of the section – log-transformed variables except for interest rates. The asterisk refers to the foreign economy.

Equation (1) states that a relative increase in money supply yields a real depreciation, while a rise in relative real income causes a real appreciation. Regarding the effects of the interest rate, a rise in the own rate of money, i.e. the short-term interest rate is expected to bring about a real appreciation because an increase in i_t^{OWN} would cause economic agents to increase real money balances and thus would result in a nominal appreciation via the PPP channel. At the same time, a rise in the long-term rate differential is related to a depreciation of the currency, which is in accordance with the uncovered interest parity condition, because a rise in i_t^{OWN} decreases money demand and leads to a nominal depreciation.

The standard monetary model can be tailored to capture the features of commodity exporting countries. El Shazy (1989) introduces a wealth term in the money demand function of the oil

227 This implies that an increase (decrease) in the exchange rate is a depreciation (appreciation) of the domestic currency vis-à-vis the foreign currency.

exporting domestic economy. The wealth term is related to the real value of oil reserves and is expressed as the relative price of oil exports to that of foreign tradable prices ($rp_t^{OIL} = p_t^{OIL} - p_t^*$) times expected oil reserves (res_t^{OIL}). Commodity prices can be added to the money demand function using a similar line of reasoning. Equation (2) below shows the modified monetary model that included real commodity prices:

$$e_t = m_t - m_t^* - \beta_1(y_t - y_t^*) + \beta_2(i_t - i_t^*) + -\beta_4 rp_t^{COM} \tag{2}$$

One strong assumption of the standard monetary model is that PPP holds for the economy as a whole, i.e. the real exchange rate is stable over time. However, according to the well-known Balassa-Samuelson effect, the real exchange rate may appreciate systematically because of the impact of productivity gains in the tradable sector on the relative price of non-tradables. It can be shown easily that the productivity differential between the home and foreign economies can be incorporated in the monetary model as follows:

$$e_t = m_t - m_t^* - \beta_1(y_t - y_t^*) + \beta_2(i_t^{OUT} - i_t^{OUT*}) - (1-\phi)((a_t^T - a_t^{NT}) - (a_t^{T*} - a_t^{NT*})) \tag{3}$$

where a_t^{NT} and a_t^T are productivity in the non-tradable and tradable sectors (see e.g. Crespo-Cuaresma, Fidrmuc and MacDonald, 2005). It is by now widely acknowledged in the literature that the Balassa-Samuelson effect is of little relevance for the transition economies of Central and Eastern Europe and that the observed real appreciation is mainly due to the trend appreciation of the tradable sector's real exchange rate due to a quality effect (see e.g. Égert, Halpern and MacDonald, 2006). This upward trend in goods prices in the home country can be captured by the introduction of a trend term in the money demand function of the home economy, which gives us the modified exchange rate equation as in equation (4)

$$e_t = m_t - m_t^* - \beta_1(y_t - y_t^*) + \beta_2(i_t - i_t^*) - \beta_4 trend \tag{4}$$

Table A4.3.1 Panel unit root tests

		CIS 10		CEE 16	
		c	c+t	c	c+t
	NOMINAL EXCHANGE RATE MODEL				
FX_NOMINAL_USD	LLC	**0.000**	**0.000**	**0.000**	0.134
	IPS	**0.000**	**0.000**	**0.000**	0.539
FX_NOMINAL_EUR	LLC	**0.000**	**0.000**	**0.000**	**0.000**
	IPS	**0.000**	**0.000**	**0.000**	**0.000**
M2_US	LLC	**0.000**	**0.000**	**0.000**	**0.000**
	IPS	**0.000**	**0.000**	**0.000**	**0.054**
M2_EUR	LLC	**0.000**	**0.000**	**0.000**	**0.000**
	IPS	**0.000**	**0.000**	**0.000**	0.443
REAL_GDP_US	LLC	0.530	**0.000**	**0.000**	**0.000**
	IPS	**0.056**	**0.000**	**0.063**	**0.079**
REAL_GDP_EUR	LLC	0.530	**0.000**	**0.000**	**0.000**
	IPS	**0.056**	**0.000**	**0.063**	**0.079**
NOMINAL_OIL	LLC	1.000	0.980	1.000	0.974

	IPS	1.000	1.000	1.000	1.000
	REAL EXCHANGE RATE MODEL				
RER_USD	LLC	**0.000**	0.442	**0.006**	**0.000**
	IPS	**0.000**	0.357	**0.004**	**0.000**
RER_EUR	LLC	**0.000**	**0.000**	**0.000**	**0.000**
	IPS	**0.000**	**0.000**	**0.000**	**0.000**
CAPITA_US	LLC	**0.070**	**0.004**	0.930	0.274
	IPS	**0.023**	0.832	0.990	**0.018**
CAPITA_EUR	LLC	0.198	**0.002**	1.000	**0.000**
	IPS	0.132	0.732	1.000	**0.000**
REAL_OIL	LLC	1.000	0.931	1.000	0.932
	IPS	1.000	1.000	1.000	1.000
REMITTANCES	LLC	**0.060**	**0.000**	**0.000**	**0.000**
	IPS	0.104	**0.037**	**0.003**	**0.000**

Note: LLC and IPS are the Levin-Lin-Chu t-statistic and the Im-Pesaran-Shin w-statistic. "c" an "c+t" indicate the inclusion of a constant and a constant and a trend.

Table A4.3.2 Results of the estimations: monetary model

	Vis-à-vis the US dollar					vis-à-vis the euro				
	CIS-10 – 1999-2006									
OIL_NOM	0.321		0.084	-0.005	0.094	0.193		-0.094	-0.107	-0.078
REAL_GDP		-2.008*	-1.958**	-1.279**	-0.279		-1.233	-1.272	-1.081	-0.116
M2		0.722***	0.685***	0.743***	0.681***		0.667***	0.721***	0.731***	0.688***
CAPITA				-1.570**					-0.389	
TREND					-0.062***					-0.043**
R^2 adj	0.16	0.40	0.39	0.41	0.57	0.16	0.37	0.36	0.35	0.45
No. of country	10	10	10	10	10	10	10	10	10	10
OBS	80	80	80	80	80	80	80	80	80	80
	CIS-10 – 1999-2006 – lagged oil prices									
OIL_NOM	-0.183		-0.202	-0.280	0.320	-0.360*		-0.543***	-0.592***	-0.393*
OIL_NOM(-1)	-0.398***		-0.304***	-0.278***	-0.127	-0.485***		-0.450***	-0.456***	-0.401***
OIL_NOM(-2)	-0.343**		-0.217	-0.233	0.211	-0.367***		-0.350***	-0.369***	-0.230
REAL_GDP			-1.140**	-0.690	-0.134			-0.041	0.386	0.239
M2			0.649***	0.693***	0.666***			0.658***	0.679***	0.649***
CAPITA				-1.115					-0.808	

TREND					-0.067***					-0.019
R^2 adj	0.35		0.47	0.47	0.60	0.48		0.59	0.59	0.59
No. of country	10		10	10	10	10		10	10	10
OBS	80		80	80	80	80		80	80	80

Notes: *,** and *** indicate statistical significance at the 10, 5 and 1 percent levels.

Table A4.3.3 Results of the estimations: real exchange rate models

	Vis-à-vis the US dollar				**vis-à-vis the euro**			
	CIS-10 – 1999- 2006							
OIL_REAL	0.148	0.019	0.131	0.022	0.004	-0.012	0.002	-0.010
CAPITA		-1.916**		-1.702**		-0.363		-0.296
REMITTANCES			-0.065***	-0.043***			-0.014	-0.009
R^2 adj	-0.05	0.18	0.04	0.21	-0.11	-0.12	-0.12	-0.13
No. of country	10	10	10	10	10	10	10	10
OBS	77	77	76	76	77	77	76	76
	CIS-10 – 1999- 2006 lagged real oil prices							
OIL_REAL	-0.143	-0.193*	-0.113	-0.170	-0.333***	-0.329***	-0.364***	-0.359***
OIL_REAL(-1)	-0.256***	-0.205***	-0.245***	-0.203***	-0.350***	-0.355***	-0.359***	-0.361***
OIL_REAL(-2)	-0.192***	-0.177**	-0.158**	-0.157**	-0.212***	-0.216***	-0.239***	-0.239***
CAPITA		-1.187***		-1.060**		0.230		0.130
REMITTANCES			-0.042**	-0.031			0.020	0.018
R^2 adj	0.32	0.39	0.35	0.41	0.65	0.65	0.65	0.65
No. of country	10	10	10	10	10	10	10	10
OBS	77	77	76	76	77	77	76	76

Notes: *,** and *** indicate statistical significance at the 10, 5 and 1 percent levels.

Table A4.3.4 Growth equations – bivariate relationships – all transition economies

	REAL GDP GROWTH						GROWTH RATE OF GDP PER CAPITA (PPP, USD)					
	5-YEAR AVERAGES – 1992- 3006											
X_OIL	0.647***			-0.366			0.639***			-0.500*		
X_OIL*@trend				0.239***						0.269***		
X_NATREV		0.1903			0.125			0.082			0.006	
X_NATREV*@trend					0.138***						0.154***	
MINING			1.300***			0.028			1.302***			-0.394
MINING*@trend						0.453***						0.596***
R^2	0.31	0.17	0.45	0.54	0.70	0.56	0.31	0.15	0.44	0.60	0.82	0.60
R^2 adj	-0.09	-0.32	0.12	0.26	0.51	0.27	-0.10	-0.34	0.09	0.35	0.71	0.33
No. of countries	24	24	21	24	24	21	24	24	21	24	24	21

OBS	66	66	57	66	66	57	66	66	56	66	66	56
	8-YEAR AVERAGES – 1991 – 2006											
X_OIL	0.814***			0.060			0.914***			-0.222		
X_OIL*trend				0.254**						0.383***		
X_NATREV		0.047			0.031			-0.02			-0.043	
X_NATREV*@trend					0.211***						0.257***	
MINING			1.087**			-0.729			1.098**			-0.389
MINING*@trrend						1.140**						1.297***
R^2	0.42	0.14	0.44	0.57	0.81	0.74	0.40	0.10	0.48	0.68	0.94	0.79
R^2 adj	-0.21	-0.80	-0.26	0.05	0.58	0.37	-0.25	-0.89	-0.17	0.30	0.86	0.51
No. of countries	24	24	21	24	24	21	24	24	21	24	24	21
OBS	47	47	39	47	47	39	47	47	39	47	47	39

Notes: *,** and *** indicate statistical significance at the 10, 5 and 1 percent levels.

Table A4.3.5 Growth equations – initial conditions, 5-year averages – all transition economies

	GROWTH RATE OF GDP PER CAPITA (PPP, USD)						
X_OIL	**-0.094***	**-0.095***	**-0.110***	**-0.094***	**-0.096***	**-0.092***	**-0.117****
X_OIL*@trend	**0.120*****	**0.121*****	**0.127*****	**0.117*****	**0.122*****	**0.121*****	**0.125*****
CPI	-0.009***	-0.009***	-0.009***	-0.008***	-0.009***	-0.009***	-0.009***
OPEN	0.000	-0.002	0.000	-0.010	0.000	-0.001	-0.009
GOVC	-0.314	-0.321	-0.176	-0.247	-0.290	-0.287	-0.262
INV	0.126	0.115	0.123	0.112	0.135	0.132	0.142
INSTIT	0.208	0.276	0.244	0.220	0.400	0.350	0.262
LABFOR	0.095	0.092	0.140	0.357	0.016	0.037	0.134
REMIT	0.428***	0.414***	0.405***	0.387***	0.410***	0.406***	0.439***
EDU1	0.143**	0.164**	0.159**	0.165***	0.138*	0.154**	0.123*
HEALTH2	0.015	0.007	0.008	0.036	0.013	0.013	0.017
CORR_TI?						-0.037	
CORR_WB?							0.826
	INITIAL CONDITIONS						
LOG(CAPITA90)	0.857						
FDEBT_93		-0.008					
HEALTH1_92			-0.456				
HEALTH2_92				-0.087*			
EDU1_92					0.027		
R^2	0.73	0.73	0.73	0.74	0.73	0.73	0.74
R^2 adj	0.66	0.66	0.67	0.68	0.66	0.66	0.67
No. of countries	22	21	22	22	22	22	22
OBS	63	60	63	63	63	63	63

Note: *, ** and *** indicate statistical significance at the 10, 5 and 1% levels.

Appendix 4. Background material for Chapter 5

This annex contains additional tables related to Chapter 5 of the report.

Table A.5.1 Energy import dependence of EU countries in 2005, %

	Energy	Crude oil	Natural gas
Austria	72	92	88
Belgium	80	101	101
Bulgaria	47	103	88
Cyprus	101	102	-
Czech Republic	27	97	98
Denmark	-52	-105	-114
Estonia	26	72	100
Finland	55	99	100
France	52	100	99
Germany	62	97	81
Greece	69	98	99
Hungary	63	79	81
Ireland	90	100	87
Italy	84	92	85
Latvia	56	102	106
Lithuania	58	93	101
Luxembourg	98	99	100
Malta	100e	100e	-
Netherlands	38	97	-59
Poland	18	96	70
Portugal	88	102	104
Romania	27	38	30
Slovak Republic	65	82	97
Slovenia	52	101	100
Spain	81	101	101
Sweden	37	104	100
United Kingdom	14	-3	7
EU27	52	82	58

Note: Energy import dependency shows the extent to which a country relies upon imports in order to meet its energy needs. It is calculated using the following formula: net imports / (gross inland consumption + bunkers). Values over 100% are possible due to changes in stocks.

Source: Eurostat (2007a).

Table A.5.2. Value of EU energy imports from CIS, Russia and totals, million USD

	From CIS			From Russia			Total energy imports			Share of CIS energy import in total energy imports, %		
	1998	2002	2006	1998	2002	2006	1998	2002	2006	1998	2002	2006
Austria	220	573	1507	113	174	616	2318	4584	18471	9.5	12.5	8.2
Belgium	--	868	3518	0	848	3436	--	15647	47722	--	5.5	7.4
Bulgaria	817	130	265	767	38	120	993	270	1229	82.3	48.2	21.6
Cyprus	83	113	126	83	111	18	243	445	1271	34.3	25.4	9.9
Czech Rep.	1129	1657	5833	1124	1433	4561	1874	3087	8397	60.3	53.7	69.5
Denmark	155	172	1125	155	165	777	1302	2167	4984	11.9	7.9	22.6
Estonia	170	303	1429	167	277	1190	272	421	2122	62.4	72.1	67.3
Finland	1146	2273	6829	1107	2124	6464	2387	3856	10647	48.0	58.9	64.1
France	1756	4695	14688	1693	4002	10766	16712	27846	78201	10.5	16.9	18.8
Germany	2894	7343	23864	2731	6067	19313	26294	41279	111330	11.0	17.8	21.4
Greece	314	2292	4162	278	1943	3671	2217	4515	12205	14.2	50.8	34.1
Hungary	1243	2099	3626	1138	1887	3078	1616	2772	5717	76.9	75.7	63.4
Ireland	2	5	63	2	3	54	1126	1688	5836	0.2	0.3	1.1
Italy	1366	4548	12472	1194	2906	6277	12010	21956	53917	11.4	20.7	23.1
Latvia	219	222	752	207	164	368	315	375	1451	69.6	59.1	51.8
Lithuania	778	1239	4119	763	1227	4038	827	1267	4337	94.1	97.8	95.0
Luxembourg	--	0	0	--	0	0	--	632	1884	--	0.0	0.0
Malta	0	21	1	0	20	0	101	238	384	0.0	8.9	0.1
Netherlands	488	2755	11646	481	2670	11368	10480	19353	58958	4.7	14.2	19.8
Poland	1952	4115	9965	1807	3863	8937	2964	5039	13018	65.9	81.7	76.6
Portugal	64	198	1089	64	188	561	2048	3850	10079	3.1	5.2	10.8
Romania	965	1733	5741	927	1164	3638	1431	1992	6910	67.5	87.0	83.1
Slovakia	1082	1827	4694	1023	1794	4579	1427	2229	6028	75.8	82.0	77.9
Slovenia	90	178	328	88	149	312	562	771	2571	15.9	23.1	12.8
Spain	540	2122	8795	528	1880	7678	8575	17956	51803	6.3	11.8	17.0
Sweden	77	647	3654	77	646	3550	3565	5804	15739	2.2	11.1	23.2
United Kingdom	274	1315	9260	274	1203	6905	7706	14303	54241	3.6	9.2	17.1
EU27	17823	43443	139549	16789	36947	112273	109365	204341	589451	16.3	21.3	23.7

Source: own calculations based on Comtrade.

Table A.5.3 Caspian region oil and oil product exports, 2006

Azerbaijan		Kazakhstan		Turkmenistan		Uzbekistan	
Export destinations	%	**Export destinations**	%	**Export destinations**	%	**Export destinations**	%
Italy	52.8	Switzerland	26.0	Italy	31.3	China	36.0
Israel	12.8	Italy	20.0	Georgia	15.1	Ukraine	20.2
France	6.5	France	12.6	Azerbaijan	9.0	Poland	8.6
Turkey	5.6	Iran	6.6	United Kingdom	8.0	Estonia	6.1
Georgia	4.3	China	5.6	Romania	6.9	Lithuania	5.9
Iran	3.9	Netherlands	4.3	France	6.1	Kazakhstan	5.1
Greece	3.4	Spain	3.6	Germany	5.6	Kyrgyzstan	3.8
Total in million USD	5 361		24 850		651		110

Note. Data for Turkmenistan and Uzbekistan come from "mirror statistics" (data from partners)

Source: Comtrade.

Table A.5.4 Caspian region gas exports, 2006

Azerbaijan		Kazakhstan		Turkmenistan		Uzbekistan	
Export destinations	%	**Export destinations**	%	**Export destinations**	%	**Export destinations**	%
Georgia	44.6	Ukraine	37.1	Ukraine	86.9	Ukraine	39.2
Bulgaria	28.8	Poland	13.3	Hungary	4.4	Romania	20.3
Iran	10.5	Russian Federation	11.5	Armenia	4.0	Kazakhstan	16.8
Albania	6.4	Turkey	9.9	Kazakhstan	2.6	Hungary	15.6
Turkey	4.9	Hungary	7.1	Slovakia	1.3	Kyrgyzstan	5.6
Romania	2.3	Azerbaijan	6.0	Azerbaijan	0.8	Azerbaijan	2.5
Total in million USD	**9.9**		**898**		**4 004**		**735**

Note. Data on total export values should be treated with caution (no direct and cross-checked sources) and may not correspond to the effective contracts and flows. Data for Turkmenistan and Uzbekistan is acquired from "mirror statistics" (data from partners). For example IEA (2007a) for 2006 indicates sales of Uzbek gas to Poland well above exports to Hungary.

Source: Comtrade.

Appendix 5. Background material for Chapter 6

This appendix provides additional tables for Chapter 6.

Table A6.1 Gazprom's acquisitions in CIS gas sector

Country	Brief description
Armenia	57.6% stake in Armrosgazprom, the Armenian gas supply monopoly (also controlling Armenian part of Iran-Armenia gas pipeline) (Gazprom share might increase to 80%). Gazprom took over the 5th block of Hrazdan gas-fired TPP running on Iranian gas.
Belarus	25% of Beltransgas (expected to increase to 50%)
Georgia	Natural gas distributor Tbilgas (in 2006 sold to KazMunaiGaz) and main fertiliser plant Azoti (via Itera).
Moldova	Moldovagaz JSC is a joint-venture of Gazprom (>50%) and Moldovan state (35.5%). Gazsnabtranzit, where Gazprom owns 50%.
Ukraine	Gas imports: RosUkrEnergo (50% Gazprom) UkrHazEnergo supplying industrial clients, with a market share of almost 75% (50% RosUkrEnergo, 50% Naftohaz)

Source: Gazprom, company reports, press articles.

Table A6.2 RAO UES acquisitions in the CIS electricity sector

	Transit, export	Generation	Capacity	Transmission, distribution
Armenia	-	Armenian hydroelectric plants 90% stake in ZAO "International Power Corporation" which operates the Sevan-Razdansky chain of seven HPPs (Hrazdan TPP) The right to manage the 100% stake in ZAO "Armenian Nuclear Power Plant" under a fiduciary arrangement.	12-15 MW The installed capacity of the power plants is 560 MW The plant's installed capacity is 815 MW	100% stake in ZAO "Armenia Electricity Grids", the distribution company which owns the 0.4-110 kV networks and supplies electricity to all consumers in Armenia)
Georgia	50% stake in energy exporter AES Transenerg y	Two hydroelectric power plants "Tbilsresi" The right to manage 100% shares in AO "Khrami HPP I" and AO "Khrami HPP II". 100% in "Mtkvari TPP", the company owns power units 9 and 10 at the Tbilisskaya TPP, (generating approximately 20% of country's consumption).	740 MW 2 x 110 MW (installed capacity) Each having an installed capacity of 300 MW.	75% in AES "Telasi" (distribution company which owns the 0.4-110 kV networks and substations) AES Mtkvari 500 kV transmission line (Kavkasioni) originating in Russia and providing for the interconnectivity of many electricity transmission lines is managed by Russian-Georgian enterprise (Russian side represented by RAO UES) - JS "Sakrusenergo").
Moldova		51% shares in Moldavskaya thermal power plant (TPP)	2,520 MW installed capacity	
Kazakhstan		Ekibastuz GRES-2, coal-fired HPP which generates 10-12% of all Kazakshatni power – co-owned by RAO UES and the Kazakh state	1,000 MW installed capacity (2 x 500 MW)	
Tajikistan		Construction of the Sangtuda HPP-1 – part of the chain of hydropower plants located on the Vakhsh River	design capacity 670 MW	-

Sources: Country background notes, RAO UES, http://www.rao-ees.ru/en/invest/reporting/reports/report2006/14_2.htm.

Table A6.3 Gazprom's most important acquisitions in the EU (as of January 2008)

Country	Sector	Company name	Gazprom ownership
Austria	Gas trade	ZGG-Zarubezhgazneftechim Trading	100%*
Austria	Storage	ZMB Gasspeicher Holding	100%****
Austria	Gas hub	Baumgarten	50%
Austria	Gas trade and distribution	Centrex Europe Energy & Gas	100%
Austria	Gas trade	GHW	50%-75%****
Bulgaria	Gas trade and distribution	Topenergy	100%
Bulgaria	Gas sales and distribution	Overgas	50%
Bulgaria	Gas trade	DEXIA Bulgaria EOOD	25.5%***
Bulgaria and Greece	Oil pipeline	Bourgas-Alexandroupolis Pipeline Consortium (BAPC)	GazpromNeft Transneft and Rosneft to hold 51% of BAPC
Bulgaria	Gas pipeline	South Stream onshore section	50% (Bulgargaz: 50%)
Cyprus	Media	Leadville Investments	n/a
Czech Rep.	Gas trade	Vemex	min 33%*
Czech Rep.	Investments	Gas Invest	37.5%
Estonia	Gas import, transport, distribution	Eesti Gaas	37%
Finland	Gas trade and distribution	Gasum Oy	25%
France	Gas trade	Fragaz	50%
France	Gas trade	Gazprom Marketing&Trading France	100%*
Germany	Marketing	Agrogaz	100%
Germany	Gas trade	Ditgaz	49%
Germany	Gas trade	GAZPROM Germania GmbH	100%
Germany	Gas trade	Gerogaz	51%
Germany	Gas transport and distribution	VNG	5.3%
Germany	Transport, storage	Wingas	35%
Germany	Gas trade	WIEH	50%

Country	Sector	Company name	Gazprom ownership
Germany	Gas trade	ZMB	100%
Greece	Gas trade, marketing	Prometheus Gaz	50%
Hungary	Gas transport and trade	Panrusgas	40%
Hungary	Petrochemicals	Borsodchem	25%**
Hungary	Petrochemicals	TVK	13.5%**
Hungary	Equipment for field operation and gas transmission	DKG-East	38.1%
Hungary	Banking	General Banking and Trust Co. Ltd	25.5%
Hungary	Gas trade	Emfesz	** via RUE
Italy	Gas trade	Promgaz	50%
Italy	Gas trade, transport	Volta	49%
Italy	Gas trade	Central Energy Italian Gas Holding	25%
Italy	Gas pipeline	South Stream onshore section	50% (ENI: 50%)
Lithuania	Gas import, transport, Distribution	Lietuvos Dujos	34%
Lithuania	Electricity generation	Kaunas Power Plant	99%
Netherlands	Blue Stream operator	BSPS B.V.	50%
Netherlands	Gas trade	PeterGaz	51%
Poland	Gas transport	EuroPolGaz	48.6%
Poland	Gas trade	Gas-Trading	35%
Romania	Gas trade	WIEH Romania	50%***
Romania	Gas trade and distribution	WIROM	25.5%***
Slovakia	Gas transport and trade	SlovRusGaz	50%
Slovenia	Gas trade	Tagdem	7.6%
UK	UK-Belgium gas interconnector operator	Interconnector	10%
UK	Gas storage	Saltfleetby	35%******
UK	Gas storage	Humbly Grove - dostęp na 5 lat do 50% pojemności	

Country	Sector	Company name	Gazprom ownership
UK	Distribution	Pennine Natural Gas	
UK	Trade, distribution	HydroWingas	35%******

* controlled by ZMB GmbH, Gazprom's subsidiary

**investment financed by Milford Holdings Ltd (Ireland)

*** via joint venture WIEH

**** 25% via Centrex Europe Energy and Gas

***** joint investment of Gazprom's subsidiaries ZMB & Centrex Europe Energy and Gas

****** via Wingas

Source: Based on Centre for Eastern Studies publications, inter alia Łoskot-Strachota (2006), www.gazprom.com, news agencies.

Table A6.4 Gazprom's most important acquisitions in other European countries (as of January 2008)

Country	Sector	Company name	Gazprom ownership
Serbia	Gas transport, trade, pipelines construction/operator	JugoRosGaz	75%
Serbia	Gas trade	Progress Gas	50%
Serbia	Oil refining and retail	NIS	51% (via Gazpromneft)
Switzerland	Gas trade	RosUkrEnergo (RUE)	50%
Switzerland	Nord Stream operator	Nord Stream	51%
Turkey	Gas trade	Gamma Gazprom	45%
Turkey	Gas trade	Turusgaz	45%
Turkey	Gas import, transport, distribution, storage	Bosphorus Gaz	40%*

* controlled by ZMB GmbH, Gazprom's subsidiary

Source: Based on Centre for Eastern Studies publications, inter alia Łoskot-Strachota (2006), www.gazprom.com, news agencies.