LAPPEENRANTA UNIVERSITY OF TECHNOLOGY
Northern Dimension Research Centre
Publication 35

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RUSSIAN TRANSITION AND OIL PRICE BOOM

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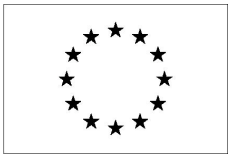
Lappeenranta 2006

ISBN 952-214-307-3 (paperback)
ISBN 952-214-308-1 (PDF)
ISSN 1459-6679



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Foreword

The Northern Dimension Research Centre (NORDI) is a research institute run by Lappeenranta University of Technology (LUT). NORDI was established in the spring of 2003 in order to co-ordinate research into Russia.

NORDI's mission is to conduct research into Russia and issues related to Russia's relations with the EU with the aim of providing up-to-date information on different fields of technology and economics. NORDI's core research areas are Russian business and economy, energy and environment, the forest cluster, the ICT sector, as well as logistics and transport infrastructure. The most outstanding characteristic of NORDI's research activities is the way in which it integrates technology and economics.

LUT has a long tradition in conducting research and educating students in the field of communist and post-communist economies. From the point of view of these studies, LUT is ideally located in the Eastern part of Finland near the border between EU and Russia.

This short report deals with structural issues in the transitional economy of Russia. The relative importance of the country in global economy has increased due to its oil and natural gas wealth, but Russia is still heavily dependent on food imports. The second author of this publication is Ph.D. student Martin Keim (University of Wuppertal, Germany) whose major research interests include economic and political aspects of financial, energy and ICT markets, as well as business and economics in Northern and Eastern Europe.

I want to express my gratitude to Ms. Rita Sergeeva, who helped me to finalize the book.

Lappeenranta, November 2006

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1 Introduction

In the 20th century the period of Soviet power lasted almost seven and a half decades. The former Soviet Union was far the richest country in the world as far as the resource base was concerned. In her territory almost all possible minerals, including extensive oil and gas deposits, were available. Timber resources were larger than in any other country. The black soil area in Southern part of the former Soviet Union (especially in Ukraine) contains plenty of fertile soil for agricultural purposes.

The system of Soviet central planning was extremely wasteful. Prices were fixed by administrators, and thus, did not reflect production costs. Artificially low prices created an incentive to large-scale waste. Energy and raw materials intensity of products was much higher in communist countries than in the capitalist West.

Extensive resource base was a natural precondition to run a wasteful system for a rather long period of time. Because of her high level of raw material endowment Soviet Union was relatively self-sufficient by definition: foreign trade played a minor role only.

In the aftermath of the World War II several East European countries became communist. Thus, so called Eastern Bloc, which was officially integrated via CMEA (Council of Mutual Economic Assistance), existed on the Eastern side of the Iron Curtain in the post-war period. The satellite states of the Soviet Union were not endowed by natural riches. Central planning in the small CMEA countries was essentially dependent on extensive material imports from the former Soviet Union. Thus, there was a need to modify the system in order to save energy and raw materials. However, countries in the former Eastern Bloc had to give up the cumbersome communist system in the late 1980s. Soviet Union collapsed with a delay, in 1991.

The last Soviet leader, Mikhail Gorbachev, attempted to restructure the decision-making system in the second half of the 1980s. His reform scheme is known as perestroika in the history. His rather unclear reform concept caused economic chaos which ended up with a systemic change in 1991.

In the former Soviet Union, Russia accounted for 60% of total output, 60% of the total capital stock, and 55% of the total labour force. About 70% of Soviet defence industry was on Russian territory. Russia inherited about three quarters of the Soviet territory, and thus, its

landmass is nearly twice the size of the USA. The post-Soviet population of Russia was about 150 million, the equivalent to the combined populations of France, Germany, and the Netherlands.

In this context it is important to note that Russia inherited the big bulk of material riches after the division of the Soviet Union into 15 independent states. The main oil and natural gas deposits of FSU (Former Soviet Union) are in Russian Federation. Thus, Russia has far the best preconditions to complete the transition in the most successful way among all post-communist societies. This point is underlined by high energy prices in the second decade of transition.

A part of the Soviet legacy in Russia is in the rural economy. Agriculture was in the Soviet model used as a source of capital for urbanization. In the Soviet era, foodstuffs were imported in large scale. There were permanent bottlenecks in food supplies. Especially downstream agricultural activities – transportation, storage and processing – were the most neglected and inefficient sectors of the former Soviet economy. Losses in handling could be as high as 30% for grain and 50% for potatoes and vegetables. Food distribution problem worsened and consumer food shortages grew in the 1980s. It was rather generally expected that the systemic change would soon eliminate the problem. However, in the second decade of transition, the rural economy is still far from perfect in Russia.

This short report deals with structural issues in transitional Russia, which creates more and more wealth via energy bearers, but is still heavily dependent on food imports. The rural economy has not yet fully recovered from the Soviet era ravages. At the same time, the relative importance of the Russian economy in the global scene has increased due to her oil and natural gas wealth.

2 Economic Structure of Russia

2.1 Investment

Investment is spending on physical assets. This should be distinguished from financial transactions which are known as investment in everyday language, but which are – in economic terminology – savings. Physical assets include infrastructure such as roads and airports; buildings such as dwellings, factories and schools; machinery, equipment, and vehicles. These generally provide the potential for higher output in the future. The economic (as opposed to the social) benefit of dwellings is not in boosting efficiency. However, housing is obviously a part of capital stock.

Economists call new investment in physical assets gross domestic fixed capital formation (GDFCF): gross because it is before depreciation, domestic because it is at home rather than overseas, fixed because it does not include stocks, and capital formation since it distinguishes physical from financial investment.

Every investment must be financed. In a society, in which all earnings are spent on consuming, there are no savings (I=S). If no saving takes place, local investment can be financed by capital import. It is possible that a society has more saving than local investment. That country with excess saving exercises capital export. In global scale, capital imports equal capital exports.

In the first decade of the Russian transition investment declined steeply, but started growing in 1999. After that year investment has been on growth path.

The turnaround in Russian investment activity in the second decade of transition has one very important background factor. Semi-fixed exchange rate of RUB (Russian rouble) collapsed causing a very strong depreciation of the currency. Local products became relatively advantageous in comparison to imported alternatives. Rouble crisis of 1998 improved investment climate essentially (for details, see T. Tiusanen – J. Jumpponen: Russian Transition in the Early 21st Century. NORDI publication No. 22, Lappeenranta, 2005).

Even if investment in Russia has grown since 1999, her investment quota (the share of investment of local GDP) is relatively modest. In communist era, all centrally planned economies had permanently high investment quotas (of some 30–40%). In investment activity

efficiency criteria were always questionable in central planning. It means that capital was wasted in rather massive scale. Especially the quality of capital in machine and equipment sphere was neglected. Technology did not advance optimally in centrally planned economies.

In the turn of the 1980s and 1990s, the investment quota in Russia collapsed and was only about 15% of GDP in the late 1990s. According to The Vienna Institute for International Economic Studies (WIIW), the share of investment of Russia's GDP in 2005 was less than 20%, which is a rather low figure when the development stage of Russia is taken into consideration. The equivalent figure in China is about 48%. Rampant investment boom is the core factor in China's rapid economic growth. However, overall growth rates in these two countries have not in the last five years shown essential differences in favour of China.

In both cases (Russia and China), current accounts are in surplus. A country with current account surplus has in her external economy more revenue than expenditure. Current account (CA) surplus is the mirror image of net capital export. Thus, Russia and China both contribute to finance the rest of the world (RoW), even if both countries have a relatively modest income level (in international comparison). At the same time, the largest economy of the world, USA, has continuous CA deficits which must be financed from RoW. The situation in the global economy is thus paradoxical: rich America borrows money from RoW in massive scale.

China's investment quota is phenomenally high. Obviously, the country is facing the danger of overinvestment. In the 1990s, some fast growing economies in South-East Asia (Thailand, Malaysia, Indonesia, South-Korea) were called "tigers" or "dragons". These fast-growing economies expanded their capacities rapidly creating also so called "white elephants" which is the synonym of unviable business.

Excessive investment boom in "tiger economies" caused a severe economic crisis. Overextended credits especially in dubious activities made these economies highly vulnerable. The banking and financial systems of these economies were poorly supervised. Declining exports and efforts to defend fixed rate currencies through high interest rates caused inflated property values to fall and led to a large number of non-performing bank loans. South-East Asia went through a severe economic slump in 1997–1998.

In every strong investment boom there are risks of overheating of the economy. Overextension of credits may cause accumulation of non-performing loans and start a financial crisis. Obviously, this risk of financial turmoil is higher in China than in Russia due to differences in investment quotas in these two countries.

It is not an aim of this short report to compare investment scenes in Russia and China in detailed form. It suffices to state that investment quota in Russia is relatively low and her CA surplus is rather high.

2.2 Production issues

In Russia's (2005) GDP about 5,4% originates from agriculture, 37,1% from industry and 57,5% from services. In the light of these figures, transitional Russia is a post-industrial society. The relative importance of industry has been in decline in the post-Soviet era.

In the early period of transition, manufacturing activity went down rather rapidly. Mining suffered a slump which was less dramatic than the decline in manufacturing.

Table 1. Production Indices of Main Types of Manufacturing (1991=100)

	2001	2002	2003	2004	2005	2005 (2001=100)
Mining and quarrying of natural minerals*, total	78,8	84,2	91,5	97,7	99,0	125,6
of which:						
energy producing materials	85,8	92,1	101,6	109,4	111,4	129,8
excluding energy producing materials	57,7	57,2	58,6	63,6	61,6	106,8
Manufacturing*, total	52,0	52,6	58,0	64,1	67,8	130,4
of which:						
food products, including beverages and tobacco	58,9	63,1	67,5	70,5	73,6	125,0
textiles and textiles products	25,2	24,6	24,9	23,9	23,5	93,3
leather, leather products and footwear	17,6	19,6	21,9	21,8	21,2	120,5
wood and wood products	36,6	38,1	41,8	45,4	47,4	129,5
pulp, paper and paper products; publishing and printing	89,0	92,6	99,8	104,9	106,1	119,2
coke and refined petroleum products	61,8	64,6	66,0	67,6	71,3	115,4
chemicals and chemical products	70,0	70,1	73,9	78,8	80,8	115,4
rubber and plastic products	53,3	53,4	56,3	63,9	67,4	126,5
other non-metallic mineral products	41,8	42,3	45,4	49,2	50,9	121,8
basic metals and fabricated metal products	69,9	73,5	78,8	81,9	86,6	123,9
machines and equipment	34,4	31,4	37,4	45,3	45,3	131,7
electrical and optical equipment	49,1	45,3	64,9	87,3	105,4	214,7
transport equipment	39,1	38,7	44,1	49,2	52,2	133,5
other manufacturing	65,5	68,1	75,5	83,4	84,0	128,2
Electricity, Gas and Water Production and Supply*	78,0	81,7	84,4	85,5	86,5	110,9

* With due regard for informal activity.
Source: Rosstat (2006).

In the above table the year of the systemic change, 1991, is marked with 100. On the mining branch the original level (1991) of activity was virtually reached in 2005. The most important sub-category of mining, the production of energy bearing materials, has developed very

dynamically in the early years of the new century. This sector produced about 30% more in 2005 in comparison to 2001. The index number in 2005 was 111,4 which means that the production level of this branch was over 11% higher than in 1991.

In the second sub-category of mining (excluding energy bearers) the index value of 61,6 in 2005 is amazingly low indicating that the mining activity in post-Soviet period has gone down by almost 40%. However, this sector has signs of revival: between 2001 and 2005 there was growth of almost 7%.

Total manufacturing activity was in 2005 about two thirds of the level reached in 1991. In the second decade of the Russian transition total manufacturing has gained dynamism: in 2001–2005 there was over 30% growth.

Far the highest growth rate among manufacturing activities can be found in electrical and optical equipment production in 2001–2005: output has more than doubled. The production level of 1991 has been surpassed.

Production of transport equipment sank strongly by no less than over 60% between 1991 and 2001. In this individual branch a recovery started in 2003. In 2005 output was 33,5% higher than in 2001. However, the output of 2005 was only about 52% of the 1991 level.

In car production local units have been protected by high custom tariffs. This protection gives local producers a very clear price advantage, but the attraction of foreign cars seems to be irresistible. As demand for foreign cars is likely to remain high amid increasing purchasing power, international car-makers have started to invade Russia via FDI (Foreign Direct Investment). Therefore, it can be assumed that manufacturing of transport equipment will be a dynamic branch for several years to come.

The next highest growth rate among manufacturing branches can be observed in machine and equipment production in the five-year period of 2001–2005: growth exceeds 30%. In this category, production was in 2005 still about 55% below the 1991 level. This branch is obviously in fierce competition with imported alternatives.

Output of wood and wood products has grown slightly less than 30% in 2001–2005. In this branch production is still less than half of the 1991 level.

About 27% more rubber and plastic products were manufactured in 2005 than in 2001. The output level of 2005 was about one third lower than in 1991.

Food processing (including beverage and tobacco) has entered a relatively dynamic development path with 25% growth in 2001–2005. This important branch with rather abundant FDI involvement is only about one quarter below the 1991 level in 2005.

Production of basic metals is one of the branches, in which production decreased relatively moderately in the 1990s. In the recent years global demand especially from China has kept metal prices on a high level. Thus, many Russian firms in this branch have full capacity utilization: growth in 2001–2005 was about 24%.

Pulp and paper industry (including publishing and printing) is one of the few manufacturing branches which have surpassed the 1991 output level in 2005. This branch shows about 20% increase in 2001–2005.

Amid oil price boom petro-chemical industry shows only moderate increase of some 15% in 2001–2005. The same trend can be observed in producing other chemicals. Both branches have a relatively modest decline in the 1990s. However, production in both cases is still below the 1991 level. Therefore, it can be concluded that the oil price boom has not attracted potential investors to put money into oil refining or other chemical production capacities in Russia.

Textile branch is a special case in post-Soviet Russia. In the early period of transition, textile and clothing output collapsed almost completely. Cheap imports started to flow in from various directions, especially from Asia. Prestigious products from the West with valuable labels were introduced in the Russian upmarket. Local products had difficulties finding paying clients. In manufacturing, textile and clothing industry is the only branch in Russia, in which production is lower in 2005 than in 2001. The production in 2005 is only less than one quarter of the 1991 level.

Leather and shoe production has experienced a rather similar destiny. However, Russian leather products show some recovery in the early years of the new century. In both categories, in textile and leather, one of the major clients was the Red Army which used uniforms and boots in massive scale. In the post-Soviet Russia this part of demand is considerably more moderate.

In the Soviet era, the peak of oil production was 624 million tons in 1987. In the last full year of Soviet power (1990), oil production was 570 million tons. About 90% of Soviet oil extraction took place in the biggest Soviet republic, Russian Federation. In the early years of transition, oil production dropped to about 300 million tons, but started recovering in the turn of the century.

Table 2. Russian National Energy Statistics (millions of tons unless otherwise indicated)

	2001	2002	2003	2004	2005	Growth 2001–2005, %
Oil & gas condensate	348	380	421	459	470	35
Gas (bn cu m)	581	595	620	632	636	9
Coal	269	253	275	280	298	11
Electricity (bn kWh)	888	889	915	931	952	7

Source: RosStat.

Oil production (including gas condensate) has increased over 100 million tons or 35% in 2001–2005. However, in that period production growth shows clear deceleration.

In 1990s, Soviet Union produced 641 billion cubic metres of natural gas 80% of which was extracted in Russian Federation. In the second half of the 1990s, natural gas production in Russia was less than 600 billion cubic metres a year.

As the table above shows, there has been a steady but moderate increase in Russian gas production, altogether of 9% in 2001–2005. Coal production has grown at the same time by 11% and electricity generation by 7%.

In the pre-communist era the region between the Baltic Sea and the Black Sea was called “the bread-basket of Europe”. Central planning with collectivized agriculture changed this perception fundamentally. Shortage in food supply became the rule, not an exception. Soviet Union, a superpower in the Cold War period, imported grain from the West in the magnitude of 20–30 million tons a year. Waste of agricultural produce was appallingly high. Therefore, comparisons of food supply with long time series stretching from communist era to post-communist period are difficult.

Table 3. Russian Agricultural Production (millions of tons unless otherwise indicated)

	2001	2002	2003	2004	2005	Growth 2001–2005, %
Crops						
Grain	85,2	86,6	67,2	78,1	78,0	-8,0
Wheat	47,0	50,6	34,1	45,4	47,6	1,0
Potatoes	35,0	32,9	36,7	35,9	37,5	7,0
Vegetables	13,3	13,0	14,8	14,6	15,2	14,0
Sugar beet	14,6	15,7	19,4	21,8	21,4	47,0
Sunflower seed	2,7	3,7	4,9	4,8	6,4	137,0
Livestock products						
Meat (slaughter weight)	4,5	4,7	4,9	4,9	n/a	9,0*
Milk	32,9	33,5	33,4	32,0	31,0	-6,0
Eggs (bn)	35,2	36,3	36,5	35,6	36,8	5,0

* Growth 2001–2004
Source: RosStat.

Obviously, Russia has natural preconditions to be self-sufficient in grain production. However, weather conditions vary strongly. That is visible in grain harvest figures. Weather in 2003 was exceptionally bad from agricultural point of view: grain crop was almost 20 million tons less than in the previous year. In the period under review (2001–2005) grain harvest went down by 8%.

Potato cultivation shows a rather stable development with some increase in 2001–2005 (7%). Vegetable supply has at the same time grown more clearly, by 14%.

Food processing industry has plenty of dynamism in transitional Russia. This industry has started contract farming: sugar beets and sunflower seeds are now cultivated on the basis of contracts between farmers and processors. The former shows an increase of almost 50%, while the latter has more than doubled in the period under review (2001–2005).

Amid increasing living standard there is rapidly growing demand for livestock products. However, the local supply seems to be unable to satisfy the increasing needs. Therefore, imports of meat, milk and eggs are likely to increase in several years to come.

2.3 External Economy

Russia is one of the main producer and exporter of oil. In addition, Russia exports natural gas in massive scale, mainly to EU-countries. In the Soviet period all internal prices deviated from world market prices. It meant in actual fact that Russian Federation subsidised the energy bill of other Soviet republics. Also Soviet satellite states in the former Eastern Block

got Soviet oil and gas deliveries below the world market price. Russia has increased prices of oil and especially gas deliveries to former communist neighbours, which has caused confusion.

Table 4. Russian Foreign Trade in 2005

	% of total
Principal exports	
Oil, fuel & gas	63,3
Metals	14,1
Machinery & equipment	5,6
Chemicals	5,9
Main destinations of exports	
Netherlands	10,1
Italy	9,6
Germany	8,1
China	5,4
Principal imports	
Machinery & equipment	44,0
Food & agricultural products	17,7
Chemicals	16,5
Metals	6,9
Main origins of imports	
Germany	13,4
Ukraine	7,9
China	7,4
US	4,6

Source: EIU.

In the Russian export structure, oil, fuel and gas has a predominant position with a 63,3% share. Metals is the second most important position with over 14%, while machinery and equipment and chemicals have each a share of less than 6%.

A big part of Russian export oil is delivered to European spot market, and thus, Netherlands is the main export partner (because of Amsterdam oil terminal). Germany is the largest user of Russian natural gas in EU-region. Italy and Germany are both important destinations of Russia exportables, while China's role in Russian export business is increasing rapidly.

Traditionally, Russians appreciate German technology, including German-made cars. In the import structure, machinery and equipment has a predominant position with 44%. Germany is in the first place in Russian import statistics with 13,4% of total.

Almost 18% of Russian import is food. A large part of this category comes from "near abroad" (other former Soviet republics), especially from Ukraine. After Germany, Ukraine is the second most important source of Russian imports with an almost 8% share.

The Russian exports statistics show clearly how important selling energy bearers across the borders is for the country. Almost two thirds of income in merchandise trade come from this position.

Oil prices on the world market have shown plenty of fluctuations in the last three decades. Natural gas prices are closely following oil price trends in global trade.

Table 5. World Market Price of Oil (Brent), Annual Average

Year	USD/bbl
1990	23,73
1991	20,00
1992	19,32
1993	16,97
1994	15,82
1995	17,02
1996	20,67
1997	19,09
1998	12,72
1999	17,97
2000	28,50
2001	24,44
2002	25,02
2003	28,83
2004	38,27
2005	54,48

Source: BP Statistical Review, IEA.

During the first decade of Russian transition, world market price of oil fluctuated between USD 13 and 24 per barrel. In the light of the above table it can be maintained that the relatively modest oil price was one factor which made the early years of Russian transition difficult.

In the turn of the century, there was a clear revival of global oil price. Barrel value increased by over ten dollars in 2000. A moderation of the barrel price took place in 2001–2002, but a strong upward trend can be observed in 2003–2005. This convenient trend from exporter's point of view continued in 2006. "Oil boom" of the current decade is visible in balance of trade figures.

Table 6. Exports and Imports of Goods in Russia, EUR billion

	2001	2002	2003	2004	2005	Growth (%), 2001–2005
Exports of goods	114	113	120	147	196	72
annual growth rate in %	0,2	-0,2	6,0	22,5	32,8	
Imports of goods	60	64	67	78	101	68
annual growth rate in %	23,8	7,4	4,4	16,4	28,5	

Source: WIIW.

Merchandise trade exports have increased extremely fast in 2004–2005, mainly due to favourable prices of energy bearers and metals. In 2001–2005 export value grew no less than 72% reaching almost EUR 200 billion in 2005. In the same period import value increased slightly more moderately, by 68%, reaching EUR 100 billion in 2005. Thus, balance of trade has a surplus of almost EUR 100 billion in 2005.

In the current account (CA) of Russia, the service component is relatively modest. In the balance of services Russia has permanently deficits.

Table 7. Exports and Imports of Services in Russia, EUR billion

	2001	2002	2003	2004	2005
Exports	12,8	14,4	14,4	16,3	19,7
Imports	22,0	24,8	24,0	27,1	31,5

Source: WIIW.

In her balance of services Russia has an annual deficit of some EUR 10 billion which is rather moderate in comparison to the high trade surplus. In addition, the CA component of investment income (net interest and profit) is in deficit permanently. In the booming economy of Russia, there is an increasing number of foreign workers mainly from other CIS-countries who send part of their income back home. Thus, workers remittances cause an increasing outflow of money from Russia (in net figures).

However, the combined deficits in services, investment income and transfers are conveniently overcompensated in current account by huge surpluses in trade balance in the first years of the new century.

Table 8. Current Account of Russia

	2001	2002	2003	2004	2005
Surplus, € bn	37,9	30,8	31,3	47,1	67,7
CA in % of GDP	11,1	8,4	8,2	9,9	11

Source: WIIW.

Russia's CA shows a high annual surplus of about 10% of GDP in average. The absolute figure (in euro) and the relative figure (in % of GDP) show an increasing tendency. The main background factor is the price trend of energy bearing exports.

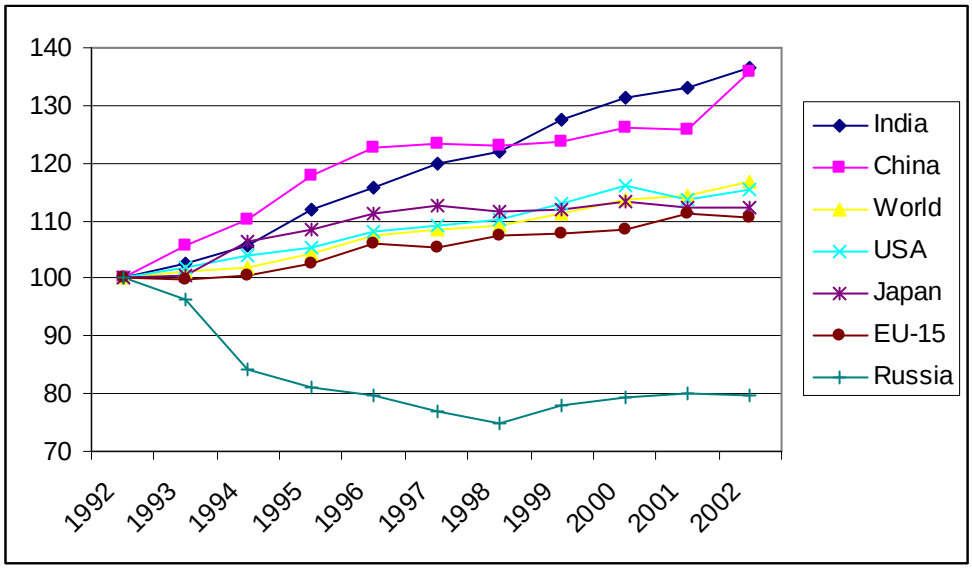
Thus, it is natural that Russia is attempting to maximize her export income of energy bearers amid the relative oil crisis in the global economy. At the same time, Russia is well aware that oil and natural gas markets have a high volatility. Russia's energy sector's trends are covered in chapter 3.

3 Energy Markets: Demand and Supply

3.1 Global Trends

During the last decade the global demand for energy has risen tremendously despite all discussions on environmental pollution, global warming and natural hazards. There is a highly positive correlation between economic growth (measured in GDP figures) and energy consumption. Especially India and China, the world's fastest growing economies had a rising energy demand by roughly 35% in that period, the Triad of the industrialized economic blocs (USA, Japan, EU-15) experienced a moderate increase by 15% while the global average is on the same level. Russia faced a huge economic slowdown after the collapse of the Soviet Union. However, the level of energy consumption has grown moderately since 1998 (1998–2002: +6%).

Figure 1. Global Gross Inland Consumption of Energy, Mtoe, index based

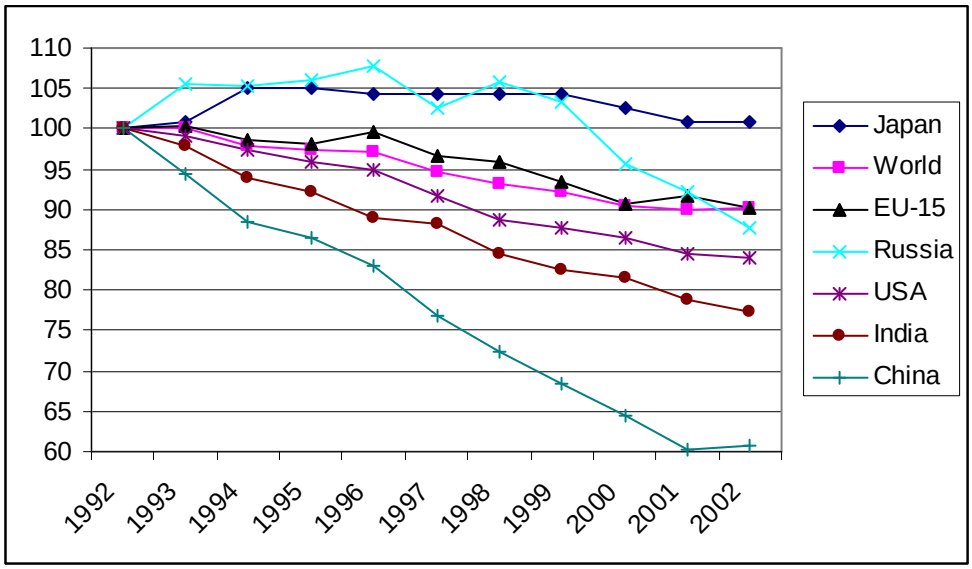


Source: European Commission (2004b).

Energy intensity indicator measures the ratio of the quantity of energy input that is required in order to get an economic value added (mostly measured by GDP figures). The higher the energy intensity of an economy, the more likely it is vulnerable to rising energy prices. There are further important reasons to lower the energy intensity: First, companies become more competitive, secondly, the households have more money for consumption, and, thirdly, the environmental pollution could be lowered.

During the last decade the global energy intensity was lowered by roughly 10%. In this respect, especially China (-40%) and India (-23%) show extremely good results. Russia (-12%) and other transitional economies in Europe show decreasing energy intensity. Improvement has taken place in both, USA and EU-15, while Japan's energy intensity curve is stagnant.

Figure 2. Global Changes in Energy Intensity, toe/MEUR, index based



Source: European Commission (2004b).

The meaning of the oil price is very significant not only for the general impacts on an economy but also for other corresponding energy prices (e.g. gas prices), where positive correlations can be observed. Especially for those countries that are dependent on oil imports – and this is the situation for the most industrialized European countries – the oil intensity is an indicator which should not be underestimated in its implications on the economy.

According to a survey by the Economist Intelligence Unit (EIU), most of the EU-15 countries have to deal with an oil intensity below the world average (=1,0), although the range among the ranked countries (altogether 65) is very huge, as the following table shows. It is said that "a sharp rise in oil prices has accompanied every pronounced global economic slowdown for the last 30 years (1973–74, 1979–80, 1990, 2000–01)." The steadily rising oil price is a result of many factors: The increasing demand from China, India, the USA and Europe as well as the partly non-adequate spare capacity in oil production.

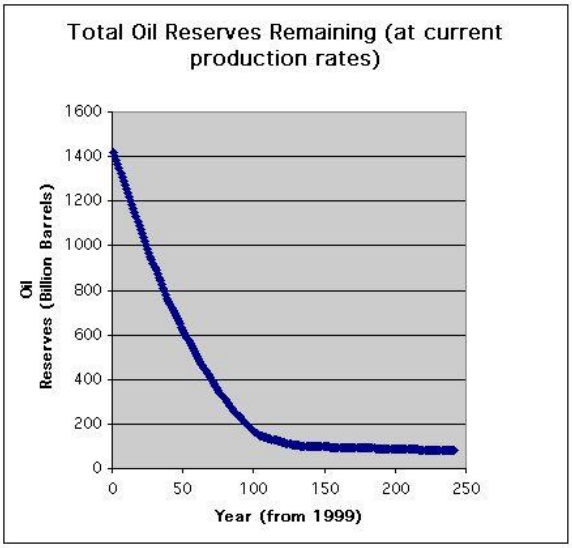
Table 9. Oil Intensity Ranking, 2004

	Country	Index score
Top 5	Turkmenistan	9,37
	Azerbaijan	6,35
	Iran	5,84
	Saudi Arabia	4,05
	Bulgaria	3,57
	Russia	2,12
	China	2,00
	India	1,95
CEEC	Lithuania	1,91
	Czech Republic	1,31
	Slovakia	1,22
	Poland	1,02
	Hungary	1,00
World Average		1,00
Nordic Countries	Iceland	0,90
	Finland	0,62
	Norway	0,50
	Germany	0,45
	Sweden	0,43
	Denmark	0,41

Source: EIU.

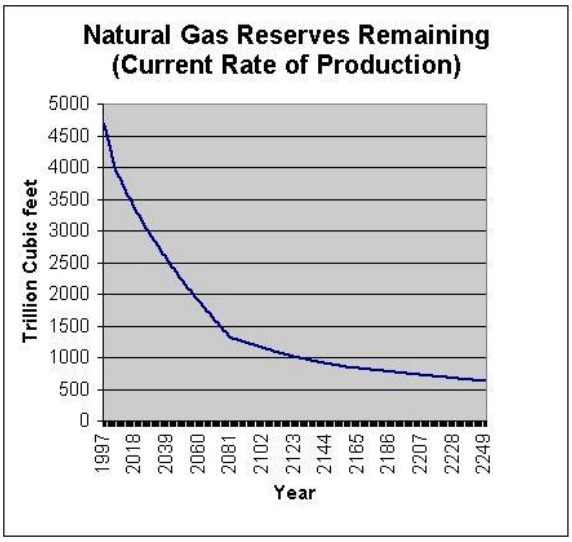
Natural energy reserves can be exploited up to a certain limit. Since the most energy products cannot be copied or artificially reproduced, their natural deposits sooner or later will come to an end. The following figures show that especially oil, gas and coal reserves will come to a crucial point in about 100 years. This also means that there is the need for sustainable energy policies to reduce the energy intensity.

Figure 3. Total Oil Reserves Remaining



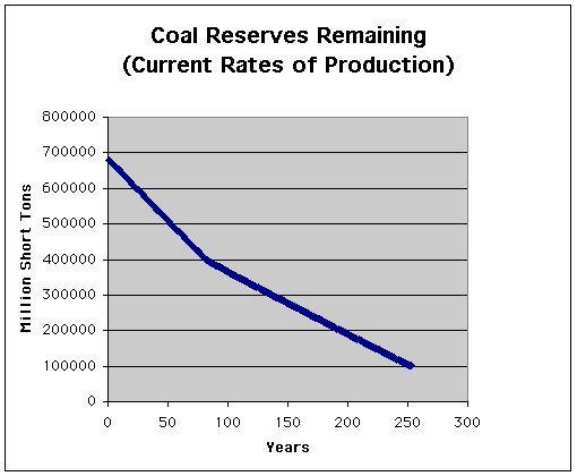
Source: Forinash, K.

Figure 4. Total Natural Gas Reserves Remaining



Source: Forinash, K.

Figure 5. Total Coal reserves Remaining



Source: Forinash, K.

Obviously, it is impossible to predict the exhaustion of existing energy reserves in exact terms. Figures above describe one possible scenario of future reserves concerning oil, gas and coal.

Oil reserves within the European Union are very low. Just Denmark, Italy, the United Kingdom (and Romania as a future member) have altogether about 0,6% compared to the world's total reserves. Norway, a member of the EFTA and one of the most important suppliers of oil has a reserve of 0,8%. FSU (former Soviet Union) has a share of 10–11% (Russia: 6,1 %, Kazakhstan: 3,3%, Azerbaijan: 0,6%, Others: 1%). Altogether the European and the Eurasian countries have 11,7% of the world's total reserves. (BP 2005). The main part

of the global oil reserves is on the countries of the Middle East (61,7%). All of them belong to the OPEC cartel whose member states cover nearly 75% of all world oil reserves. This domination is quite problematic because oil business negotiations have to run with those countries that have different cultures and economic systems. This affects the global oil supply, demand, and finally the oil prices.

Table 10. World's Oil Reserves

Zone	Share of total reserves (%)
Middle East	61,7
Europe & Eurasia	11,7
Africa	9,4
South & Central America	8,5
North America	5,1
Asia Pacific	3,5
OECD	7,0
OPEC	74,9
CIS	10,2
Other Non-OPEC	14,9

Source: BP (2005).

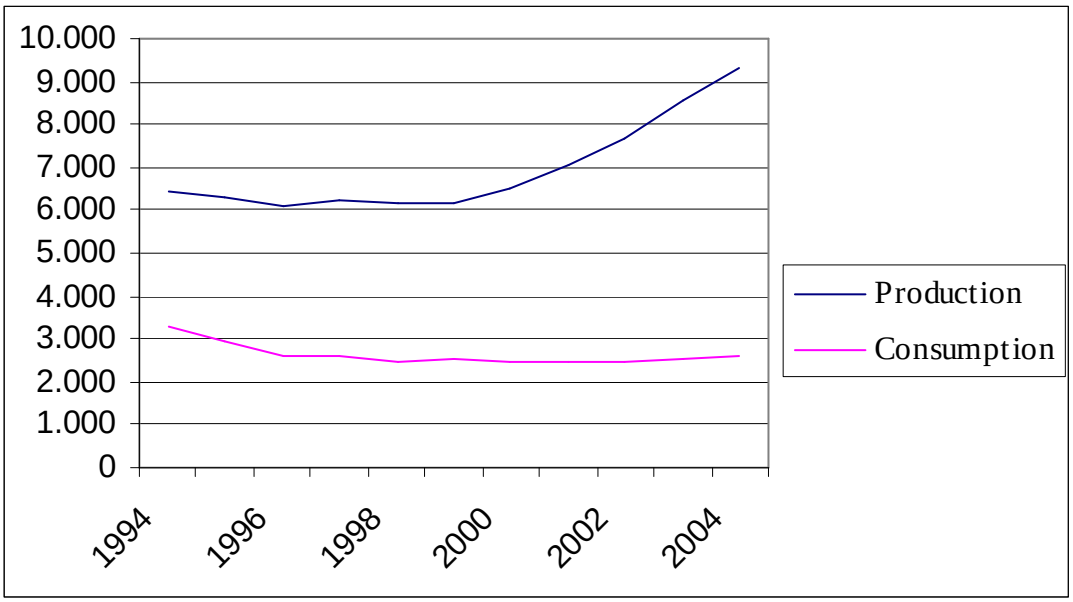
Russia acts as a major and reliable supplier of oil and gas. The EU-25 countries receive 30% of the delivered oil from Russia and 18% from Norway; Saudi Arabia (10%) and Libya (8%) play also a major role. One third of the delivered oil comes from other countries. It is obvious that the European countries emphasize a broader diversification of suppliers. (European Commission 2004).

The supply of gas is definitely less diversified: 50% of natural gas consumed in EU comes from Russia, Algeria offers 23% and Norway 22%; the rest of the world counts for 5%.

3.2 Russian Energy Sector

Russia is the world's second largest oil producer and a major oil exporter. More than 70% of the total Russian crude oil production runs abroad, while the rest remains within the Russian Federation for domestic purposes. The main export destination is EU.

Figure 6. Russia's Oil Production, 1000 bbl/d



Source: BP (2005).

While domestic consumption of oil in Russia remained on a constant level between 1999 and 2004 the production could be raised by roughly 50%, mainly for exports. One huge problem is the lack of sufficient refinery capacities which leads to an increasing level of raw oil export. Moreover, the refinery sector needs modernization.

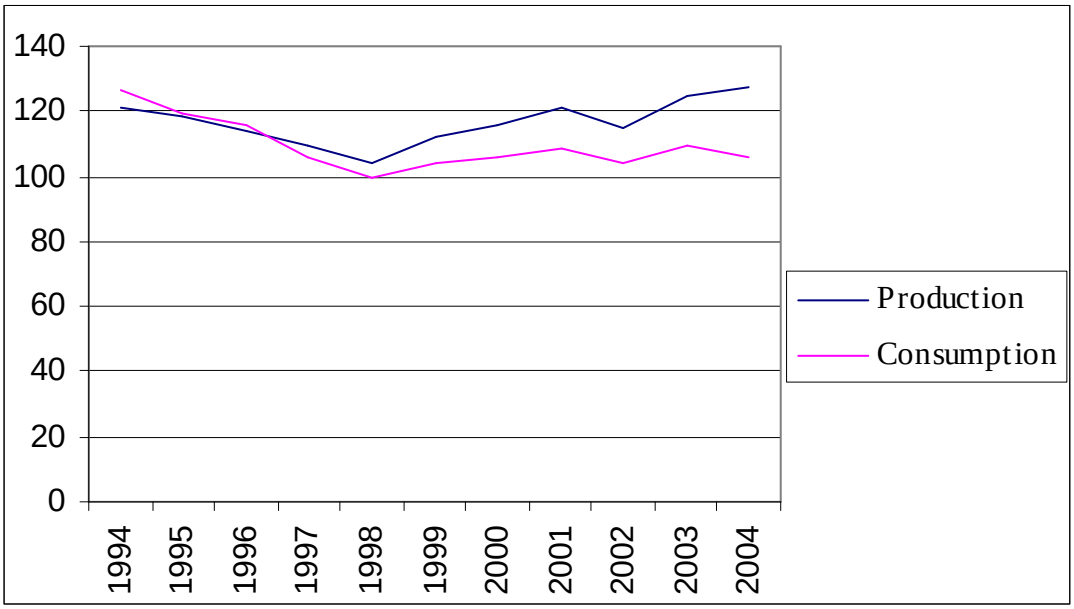
Russian oil reserves will last for roughly 22 years, under constant production level of 9.285.000 bbl/d = 3.342 bn bbl/year and the given oil reserves of 72,3 bn bbl. (BP, 2005) The discussion concerning these figures and estimations is going on steadily: Dienes (2004) maintains that Russian figures were distorted via classification concepts (in terms of numbers and metrics) during Soviet times. Moreover Dienes rates the political, economic and even geological risks to be very high: the huge reserves of the most attractive region (Siberia) are situated very deep under the surface. The real amount of exploitable barrels cannot therefore be determinate exactly; additionally there is a tremendous need for high capital outlays for adequate technologies for exploiting the oil reserves as well as for special pipelines for transport (including high fixed cost components and large front-end capital outlays). Moreover it is not clear how much time – which is also a cost factor – it takes to achieve the expected results. Since these costs have to be reflected in the final oil prices the economic rationality might be questionable.

The same issue arises in terms of gas: It is questionable whether the huge gas reserves in the Barents Sea and on the Jamal peninsula could be exploited at all at reasonable costs (Götz,

2002). Probably it will be beneficial for Russia to elaborate new agreements for the transport of oil and gas through pipelines from Kazakhstan and Turkmenistan to cover future needs of these two energy bearers. Again there is a huge demand of capital for a modernized infrastructure. Also this project involves high costs.

As Russia's domestic demand for coal has virtually stagnated, amid increasing production, the net exports show a growing trend. Thus, profitability of coal mining improves, because export prices exceed domestic ones.

Figure 7. Russia's Coal production and Consumption, Mtoe



Source: BP (2005).

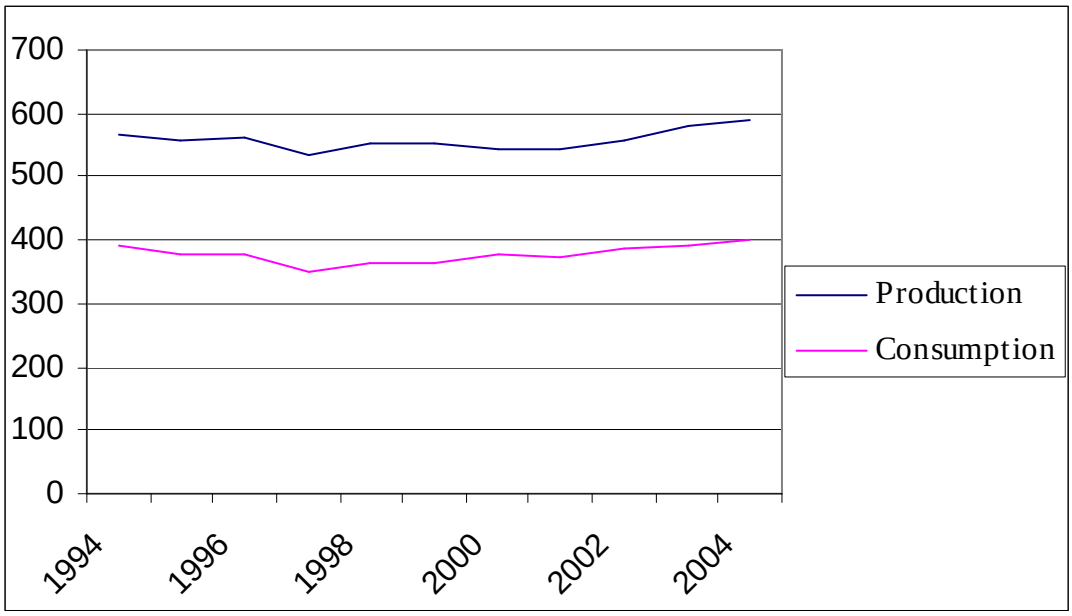
Table 11. Russian Coal Statistics, Mtoe

	1994	1999	2000	2001	2002	2003	2004
Production	121,2	112,0	115,8	121,5	114,8	124,9	127,6
Consumption	126,4	104,1	106,0	109,0	103,9	109,4	105,9
Net Exports	-5,2	7,9	9,8	12,5	10,9	15,5	21,7

Source: BP (2005).

Russia is the world's biggest producer and exporter of natural gas. Russia benefits from rising exports due to increasing production of natural gas together with moderate growth in local consumption level.

Figure 8. Russia's Gas Production and Consumption



Source: BP (2005).

About 80% of the Russian gas exports go to European countries.

Table 12. Russian Gas Statistics, Billion cubic metres

	1994	1999	2000	2001	2002	2003	2004
Production	566,4	551,0	545,0	542,4	555,4	578,6	589,1
Consumption	390,9	363,6	377,2	372,7	388,9	392,9	402,1
Net Exports	175,5	187,4	167,8	169,7	166,5	185,7	187,0

Source: BP (2005).

At the same time, gas is the most important primary energy source in domestic consumption (54%), followed by oil (19%), coal (16%), hydroelectricity (6%) and nuclear energy (5%), as table below indicates.

Table 13. Russian Primary Energy Consumption (by fuel), 2004

Fuel	Mtoe	%
Oil	128,5	19
Natural Gas	361,8	54
Coal	105,9	16
Nuclear energy	32,4	5
Hydroelectricity	40,0	6
Total	668,6	100

Source: BP (2005).

In the times of the Warsaw Pact the communist countries wasted their natural resources massively. Since the primary objective was to achieve the production aims of the Gosplan, the economic use of resources played a minor role. Price distortions (prices did not reflect market prices as in Western countries) helped to neglect the economic principles. Sustainability and environmental issues were of no interest. Thus, post-communist countries have relatively high energy intensity figures.

Table 14. Use of Oil per Production Unit – Oil Intensity of GDP, 2001

	Barrels per USD 1 million of GDP at PPP	Barrels per USD 1 million of GDP at official exchange rate
Slovakia	391	1.209
Czech Republic	423	1.166
Hungary	425	1.136
Poland	438	1.024
Romania	554	1.935
Bulgaria	582	2.673
Slovenia	599	1.111
Russia	954	3.524
Austria	438	508
Germany	476	543
USA	730	730

Source: Tiusanen (2003)/WIIW.

Energy intensity measures the primary energy demand per unit of GDP at PPP or at market exchange rates. The oil intensity therefore shows that Russia uses roughly more than double amount of oil per unit of production in comparison to the four largest CEEC countries that are members of the EU.

Russia should invest more in energy-saving methods and machines in order to save oil in production processes that again could be sold on world markets which again would increase the Russian revenues tremendously (Tiusanen, 2003). Götz (2002) recommends to modernize the domestic pipelines in order to decrease the losses during transportation.

3.3 EU's Energy Perspective

Energy has been a very important issue in the European integration since the end of World War II. Already in 1951 six European countries (The Netherlands, Belgium, Luxembourg, France, Germany and Italy) signed the first treaty – European Coal and Steal Community – and elaborated therewith a strategy not only for a balanced and strong industrial development but also for reunification of the Europeans, roughly six years after the War. This was the first

step of future integration of Europe: reconstruction, economic growth and peaceful bringing together of the European societies. One of the most crucial points was to integrate Germany within this Community via economic and military controls concerning its huge coal and steel resources.

The treaty of the European Atomic Energy Community was signed in 1957. In the same year the European Community was established. Since that time the European Economic Community has been advanced via a customs union to a well functioning single market which is now called EU.

Although almost all EU countries have to deal with a very high energy import dependency, there is a lack of a Pan-European foreign energy strategy and policy. There is no common voice that deals in the name of all EU countries with all global suppliers. In the case of EU-Russian energy relations the dialogue remains on a very abstract level.

In the EU-25 countries the energy demand has risen steadily during the last years. Between 1990 and 2002 there was an increase by roughly 8%. As the growth of production of energy has been moderate, the EU member states face an increasing energy dependency.

Table 15. Energy Statistics for the EU-25

	1990	1995	2000	2002	Change, %
Production (Mtoe)	877,84	896,80	896,60	895,86	2,05
Net Imports (Mtoe)	708,96	701,17	801,54	826,24	16,54
Inland Consumption (Mtoe)	1.553,01	1.571,44	1.652,15	1.676,89	7,98
Energy intensity (toe/MEUR)	246,00	230,00	212,00	209,00	-15,04
Import dependency (%)	44,60	43,60	47,30	48,00	7,62

Source: European Commission (2004b).

The table above gives energy data in million tons of oil equivalent (Mtoe). The abbreviation (toe) means that all energy production (consumption, import) needs a common denomination, e.g., energy production in 25 EU-countries is (2002) 895,9 million tons of oil equivalent counting all resources of energy converted in tons of oil usage. As net imports of energy in EU-25 increased by 16,5% in 1990–2002, it means that the region imported in 2002 about 117 million tons of oil equivalent (in various forms of energy) more than in 1990.

In the same period of time (1990–2002) energy intensity decreased by 15% which is a good news: EU-25 produced every one euro piece of GDP with less energy in 2002 than in 1990. In

spite of this positive result in energy saving, import dependency increased from 44,6% in 1990 to 48% in 2002, a growth of 7,6%.

Table 16. EU's Total Primary Energy Demand 2000–2030, %

	2000	2030
Oil	41	37
Gas	23	34
Coal	15	10
Nuclear	15	8
Hydro	2	2
Other Renewables	4	9

Source: IEA (2002).

The European Commission provides quite similar results, including the ten new EU member states:

Table 17. Long-term Trends in Primary Energy Demand in EU-25 (Mtoe)

						Change (%)	(% of total share)		
	1990	2000	2010	2020	2030	2000-2030	1990	2000	2030
Solid Fuels	431	303	244	253	300	-0,99	27,77	18,37	15,34
Liquid Fuels	596	636	654	672	674	5,97	38,40	38,57	34,46
Natural Gas	259	376	507	598	628	67,02	16,69	22,80	32,11
Nuclear Power	197	238	245	214	185	-22,27	12,69	14,43	9,46
Renewables	69	96	133	151	169	76,04	4,45	5,82	8,64
TOTAL	1.552	1.649	1.783	1.888	1.956	18,62	100,00	100,00	100,00
EU-15	1.321	1.453	1.576	1.657	1.719	18,31			
NMS*	234	198	208	232	240	21,21			

* NMS = New Member States

Source: European Commission (2004c), own calculations

Moreover it can be figured out that the total primary production within the EU-25 countries will decrease during the next 25 years of about one fourth of the production level of 2000. All in all it is obvious that both production and demand of renewable energy sources will increase roughly by 75% until the year 2030. Despite the high dependency on energy imports from Non-EU countries the ratio between demand and production of energy will further diverge, especially in the case of natural gas. This will lead to a critical situation when the European countries will run out of gas by the years 2020/2030. It is interesting to observe that from the year 2020 the renewable energy sources are supposed to account for the second largest production source after nuclear power.

Table 18. Long-term Trends in Primary Production of Fuels in EU-25 (Mtoe)

						Change (%)	(% of total share)		
	1990	2000	2010	2020	2030	2000-2030	1990	2000	2030
Solid Fuels	350,8	203,4	153,8	126,4	102,5	-49,61	40,01	22,67	15,51
Hard coal	236,2	135,7	90,2	72,3	58,9	-56,60	26,94	15,12	8,91
Lignite	114,5	67,6	63,7	54,1	43,7	-35,36	13,06	7,53	6,61
Liquid Fuels	120,3	163,5	131,7	102,1	86,5	-47,09	13,72	18,22	13,09
Natural Gas	139,6	196,6	196,9	147,6	117,1	-40,44	15,92	21,91	17,72
Nuclear Power	196,9	237,7	245,3	213,5	185,3	-22,04	22,46	26,49	28,04
Renewables	69,2	96,1	132,7	151,3	169,5	76,38	7,89	10,71	25,65
TOTAL	876,8	897,3	860,4	740,9	660,9	-26,35	100,00	100,00	100,00
EU-15	708	761	743	635	573	-24,70			
NMS	169	136	117	105	88	-35,29			

Source: European Commission (2004c), own calculations

Nuclear energy production will decline from 2010 due to the reason that the lifetime of lots of power plants comes to their end. Investment into new nuclear power plants is not very fashionable. However, the sector is not neglected altogether in EU area. Strengthening the renewables sector is essential in EU's energy supply.

The most urgent issue in the EU energy scene is the increasing import dependency. The table below shows the summary of the scene.

Table 19. Long-term Trends in Energy Import Dependency in EU-25

	% of total share					Change in %
	1990	2000	2010	2020	2030	2000-2030
Solid fuels	17,5	30,1	36,9	50	65,8	118,60
Liquid fuels	80,9	76,6	81,3	86	88,3	15,27
Natural gas	47,6	49,5	61,2	75,3	81,4	64,44
Total	44,8	47,2	53,1	61,9	67,3	42,58
EU-15	47,6	49,4	54,3	62,9	67,8	37,25
NMSs	28,3	30,8	44	54,8	63,6	106,49

Source: European Commission (2004c), own calculations

As it is pointed out, about three quarters of energy in the rich part of the Union (EU-15) will be imported in 2030 instead of about 50% in 2000. New member states (NMSs) will experience a doubling of import dependency from about 30% in 2000 to over 60% in 2030.

Solid fuels production within EU is in decline which will continue in the next decades. Therefore, this category will show a rapid increase in import dependency of almost 120%

between 2000 and 2030. The equivalent growth in liquid fuels (oil) will only be some 15%, because the dependency was rather high already in 2000. Natural gas reverses within EU will be exhausted in about half a century, and thus, import dependency increases fast, by 64% in 2000–2030.

In the light of the above figures it is essential to pay attention to energy saving methods and to development of renewable sources of energy within the Union. It is highly likely that the described tendency in the EU energy market will exercise heavy pressure on prices to increase.

4 Conclusions

In the seven decades of Soviet power an urban society with complex industrial structure was created. The system of central planning had devastating effect on agriculture. Cost savings were neglected in all sectors of the Soviet system. Thus, high energy and raw material intensities came into being in all communist societies. The main aim of the post-Soviet transition is to improve living standard via rational use of available resources.

Russia inherited the big bulk of Soviet energy resources. Thus, the country is one of the main net exporters of energy-bearing materials, while EU has a high and increasing energy-importing dependency. The latter has plenty of know-how in energy saving methods and technologies, by which the former could cut down her energy intensity. Therefore, mutually advantageous deals could be made in the energy sector. Decreasing energy intensity in Russia would automatically enhance her exportable surpluses of energy bearers.

As shown above in this short report, EU is not the only region in the world with increasing net energy import. On the supply side, conventional energy bearers (coal, oil, natural gas) have globally limited reserves left which seem to be in depletion. Final exhaustion timetable can hardly be estimated in exact terms. One scenario of this topic is selected for this report.

Thus, there is a very high probability that energy demand exceeds its supply in the global economy in the next couple of decades which tends to put pressure on prices to increase. Global energy market will be volatile in the immediate future.

Literature

Bergasse, E: http://www.iea.org/textbase/papers/2002/ohr.pdf.

Bernardini:
http://www.iea.org/textbase/work/2004%5Cinvestment%5Cses1.OBernardini.pdf#search=%22%22destination%20clauses%22%22.

BP (2005): Putting energy in the spotlight, BP Statistical Review of World Energy, June 2005, London.

CNB: Czech National Bank: http://www.cnb.cz/en/mp_zpinflace_prilohy_a_00_july_b1.php.

CPI (2005): Corruption Perception Index 2005, Transparency International, http://www.transparency.org/news_room/in_focus/2005/cpi_2005#cpi.

Dienes, L. (2004): Observations of the Problematic Potential of Russian Oil and the Complexities of Siberia, Eurasian Geography and Economics, Vol. 5, No.5, 319-345.

EBRD (2004): Transition Report 2004, Infrastructure, London.

EIA Brief (2005): Russia, Country Analysis Briefs, February 2005.

EIU (Economist Intelligence Unit): http://www.viewswire.com.

EIU (2005): Country Profile Russia 2005.

Estonia, Chapter 14:
http://www.europarl.europa.eu/enlargement_new/negotiations/estonia/pdf/estonia_chap14_en.pdf

European Commission (2002): First benchmarking report on the implementation of the internal electricity and gas market, Commission staff working paper, Updated version, March 2002, Brussels.

European Commission (2004): Energy and transport review 2000-2004, Luxembourg.

European Commission (2004b): EU Energy and Transport in Figures. Statistical pocketbook 2004. Directorate-General for Energy and Transport, Brussels.

European Commission (2004c): European Energy and Transport – Scenarios on Key Drivers, Brussels.

Eurostat: http://europa.eu.int/comm/eurostat/

EVA: http://www.eva.ac.at/enercee/enlargement.htm.

Forinash, K.: Indiana University Southeast, http://physics.ius.edu/~kyle/E/Reserves.html.

Götz, R. (2002): Rußlands Erdgas und die Energiesicherheit der EU, SWP-Studie Nr.12, Stiftung für Wissenschaft und Politik, Berlin.

Human Development Report (2004):
http://hdr.undp.org/reports/global/2004/?CFID=1766466&CFTOKEN=83947687.

IEA (2002): World Energy Outlook, International Energy Agency, Paris.

IEA (2003a): Key World Energy Statistics, 2003, Paris.

IEA (2003b): Energy Policies of IEA Countries, 2003 Review, Paris.

Latvia, Chapter 14:
http://www.europarl.europa.eu/enlargement_new/negotiations/latvia/pdf/latvia_chap15_en.pdf

Lithuania, Chapter 14:
http://www.europarl.europa.eu/enlargement_new/negotiations/lithuania/pdf/lithuania_chap14_en.pdf

Murray, I. (2003): www.iea.org/textbase/speech/2003/im_security.pdf

NCA (2003): A Powerful Competition Policy, Towards a more coherent competition policy in the Nordic market for electric power; Report from the Nordic competition authorities, No. 1/2003; Copenhagen, Oslo, Stockholm.

NEA (2002): Energy in Sweden 2002, National Energy Agency (Sweden).

Nordel (2001): Nordel Annual Report 2001.

Nordel (2002): Nordel Annual Report 2002.

Nord Pool (2002): Annual Report 2002, Nord Pool Spot AS.

Nord Pool (2004): http://www.nordpool.no.

NordREG (2006): Development of a common Nordic balance settlement, Eskilstuna.

OECD (1963): Atomic energy for Europe's further needs, OECD Observer No. 2, January.

Poland, Chapter 14:
http://www.europarl.europa.eu/enlargement_new/negotiations/poland/pdf/poland_chap14_en.pdf

Russia Energy Dialogue: http://europa.eu.int/comm/energy/russia/overview/index_en.htm.
SEA (2003): The Electricity Market 2003, Swedish Energy Agency, Eskilstuna.

Technology centre:
http://www.technologycentre.org/upload_files/TC_EBRD_Torsten_present_%20eng.pdf#search=%22Russian%20Federation%20%3A%20Russia%E2%80%99s%20Energy%20strategy%20until%202020%20and%20European%20Commission.%22.

The U.S. Department of Justice and Federal Trade Commission (1992), Horizontal Merger Guidelines, http://www.ftc.gov/bc/docs/horizmer.htm.

Tiusanen, T. (2003): Development of the Russian Rouble – The Crisis of 1998 and its Aftermath, Northern Dimension Research Centre, Publication No. 3, Lappeenranta University of Technology.

Van Hulst (2004): www.iea.org/textbase/speech/2004/nvh_russia.pdf.

WBGU (2004): Renewable energies for sustainable development: Impulses for renewables 2004, Policy Paper 3, Berlin.