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# Keskusteluaiheita – Discussion papers

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## RUSSIAN INFRASTRUCTURE CLUSTERS:

## A Preliminary Study

This research report is a preliminary study for the international research project “Russia’s Economy and Clusters” which we hope to carry out in the near future. The report has been produced with financing from the Finnish National Fund for Research and Development (Sitra) and the Ministry of Industry and Trade of Finland. The research was conducted by the research group formed through cooperation between Solid Invest, a St. Petersburg research and consultancy company, and Finnish Etlatieto Ltd., a project research unit of the Research Institute of the Finnish Economy (ETLA). The report is also available in electronic format on ETLA’s Web page (www.etla.fi).

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**ABSTRACT:** In this study, we focus on the Russian energy, ICT, logistics and construction clusters, referred to as infrastructure clusters. We introduce the structure of these clusters, their products and services, the main firms operating in them, their geographical locations and business perspectives. This is a pre-study that will be followed by four cluster studies later on. The four clusters reviewed here account for about 50% of Russian GDP. It should be noted that this figure only covers the production of goods and services in the clusters' central areas. The actual GDP share of these four infrastructure clusters is even higher if other related production is included in the calculation. Various huge infrastructure investments lie ahead in Russia. These approaching investments and rapid economic growth make the four Russian clusters examined here very attractive for major Russian and foreign players. At the same time many market changes are needed to ensure a positive development: more competition to replace state-controlled monopolies, greater room for private entrepreneurship and a free-market price mechanism. A negative characteristic of these infrastructure clusters, but also of the overall Russian economy, is the still high uncertainty about the direction and speed of future economic development. Both internal factors (a high dependency on political decisions made over the next few years), and external factors, arising from the currently high dependency of the entire Russian economy on world market prices of energy and raw materials, play a significant role in this.

**KEYWORDS: Russia, infrastructure, cluster, energy, ICT, logistics, construction**

**BOLTRAMOVICH** Sergey **– YURKOVSKY** Vladislav **- FILIPPOV** Pavel **– HERNESNIEMI** Hannu, **VENÄJÄN INFRASTRUKTUURIKLUSTERIT: Esitutkimus.** Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, 2005, 67 sivua. Keskusteluaiheita, ISSN 0781-6847; No. 968.

**TIIVISTELMÄ:** Tässä selvityksessä keskitymme Venäjän neljään infrastruktuuriklusteriin: energia-, ICT-, logistiikka ja rakennusklustereihin. Esittelemme klustereiden rakenteen, niiden keskeiset tuotteet ja palvelut sekä niitä tuottavat yritykset, maantieteellisen sijainnin ja liiketoiminnan kehitysnäkymiä. Kyseessä on esitutkimus. Tarkoitus on tehdä tämän jälkeen kustakin klusterista yksityiskohtaisemmat tutkimukset. Neljä tarkasteltua klusteria vastaavat noin 50 prosentista Venäjän kansantuotteesta. Kun mukaan tarkasteluun otetaan niihin liittyvää tuotantoa, klustereiden kansantuoteosuus on vielä tätä korkeampi. Venäjän on mittavien infrastruktuuri-investointien edessä. Venäjän tulevat investoinnit ja tuotannon nopea kasvu em. klustereissa tekevät näiden alojen liiketoiminnasta erittäin houkuttelevan suurille venäläisille ja ulkomaisille yrityksille. Myönteisen kehityksen aikaansaamiseksi tarvitaan kuitenkin uudistuksia: kilpailullista toimintaa valtion monopolien sijaan, tilaa vapaalle yrittäjyydelle ja vapaan markkinahinnoittelun sallimista. Epävarmuus tulevan kehityksen vauhdista ja suunnasta on kielteinen tekijä, joka varjostaa Venäjän infrastruktuuriklustereita ja koko kansantalouden toimintaa. Epävarmuus johtuu sekä maan sisäisistä että ulkoisista tekijöistä. Kehitys muutaman tulevan vuoden aikana riippuu keskeisesti maan johdon poliittisista päätöksistä ja toisaalta Venäjän voimakkaasta riippuvuudesta maailmanmarkkinoilla määräytyvistä energian ja raaka-aineiden hinnoista.

**AVAINSANAT: Venäjä, klusteri, energia, ICT, logistiikka, rakennusteollisuus**

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# 1. INTRODUCTION

Huge infrastructure investments across many lines of businesses lie ahead in Russia. At the same time many market changes are needed such as more competition, greater room for private entrepreneurship, and a free market price mechanism.

The country needs export income from energy raw materials to finance investments in different fields of society. This means new oil and gas wells, modernization of coal mines and power stations, new pipelines and ports.

Logistics has to be developed in order to make growing imports and exports possible and domestic transportation more effective for improving competitiveness.

Russia had an underdeveloped ICT sector. Now the sector is rapidly catching up to western countries in mobile communication and computing, though it still faces huge challenges such as the modernisation of basic ICT infrastructures.

These investments, together with booming residential building construction, create a big market for producers of construction materials and building products. Experience from the west has shown that high investment activity often spawns new products and services, firms and leads to the emergence of totally new kinds of industries and clusters.

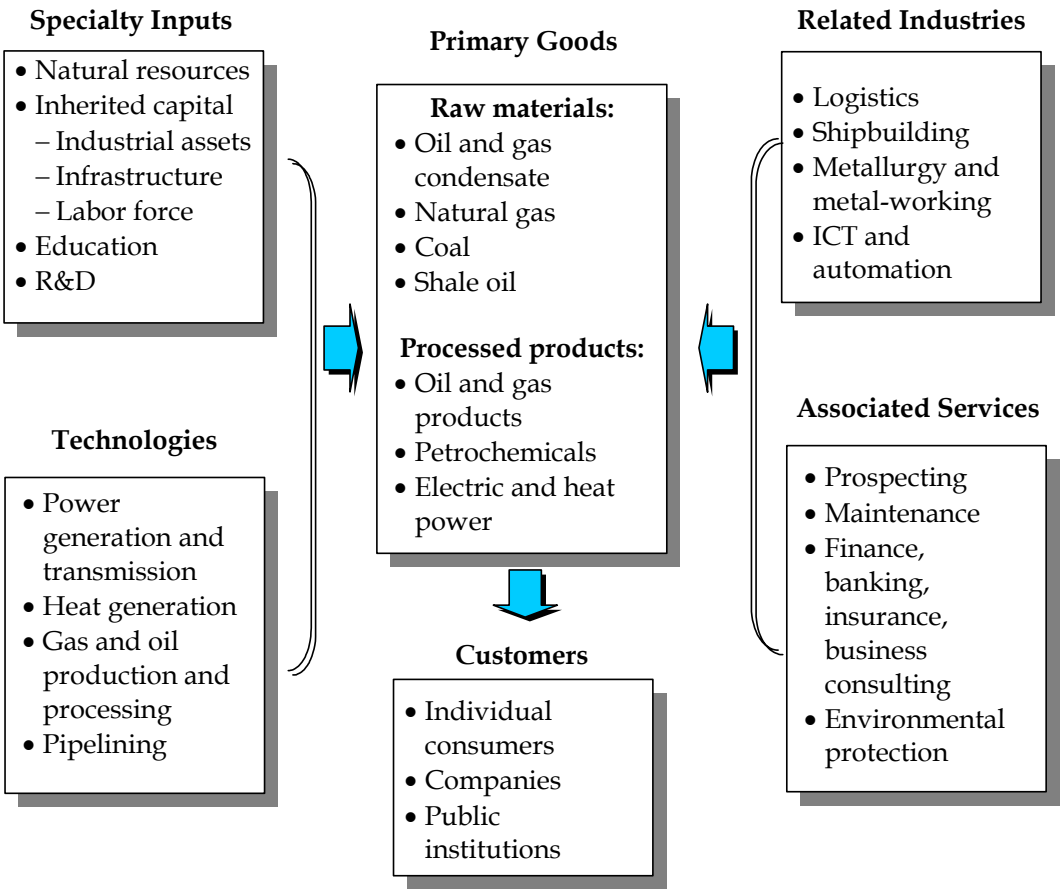
In this study we have focused on four latent or potential infrastructure clusters of Russia: the energy, ICT, logistics and construction material clusters. We will present the clusters, their products and services, the main firms operating in them, their geographical locations and business perspectives. This is a pre-study, which will be followed by four cluster studies. As regards our future research agenda, we hope to be able to achieve the following main objectives:

- Determine the position of each of the infrastructure clusters in the context of the Russian and global economies
- Analyse the structure of the clusters
- Analyse competitive strength factors
- Evaluate the prospects of international cooperation
- Make recommendations for formulating multi-level industrial policies

# 2. ENERGY CLUSTER

The energy sector is the most powerful in the Russian economy. It includes oil, gas, and coal industries, electric power industry, power engineering, and smaller oil shale and peat industries. These segments have various interconnections and experience of cooperation inherited from the Soviet period. At the same time, the lack of balance of the Soviet planned economy and the slow pace of today's reforms still hamper the formation of a working national energy cluster, despite a number of specific favorable preconditions. The cluster is likely to become a workable efficient economic entity, as market relations develop in the Russian economy.

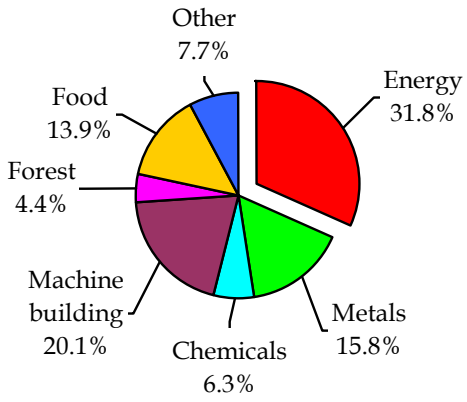
**Figure 2.1 Energy Cluster Chart**




The total input of the main energy industries (oil, gas, coal industries and electric power industry) in the Russian industry has steadily exceeded 30% in the recent years. If we add the production of power engineering industry (recorded in the Russian statistics as a part of machine building) to this figure, the share of the energy sector in the total Russian industrial output is even higher.

The development of energy industries in Russia is based on its vast and diverse natural resources: deposits of oil, natural gas, coal, hydraulic energy of rivers, etc. An important factor is that most resources are concentrated across the Urals – in Western and Eastern Siberia, and in the Far East of Russia – whereas most of the country's largest energy consumers are situated in the European part of Russia.

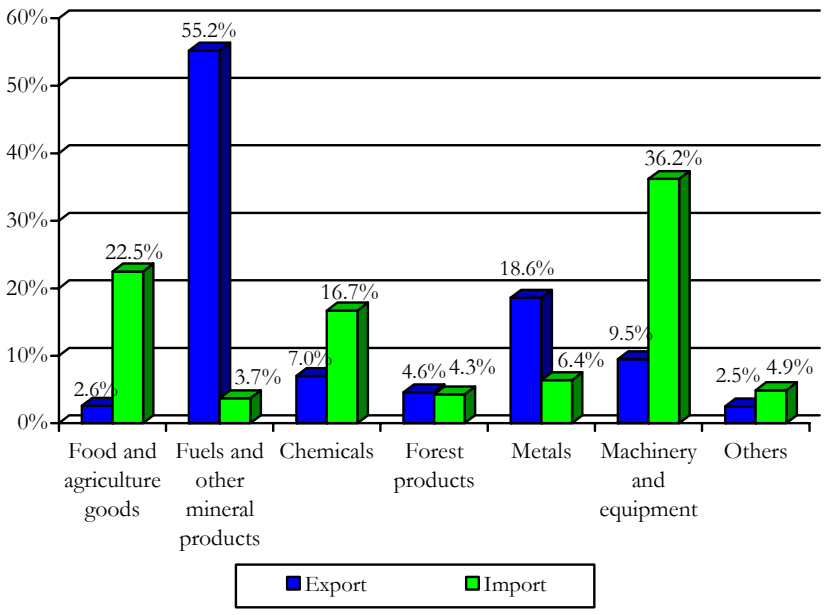
**Figure 2.2 Energy Sector among Russian Industries in 2002**




Source: Goskomstat, 2003

The energy sector can be considered as a kind of locomotive of the whole economy of the country. The growth of the Russian industry in the recent years is directly linked to high prices on energy products at the world market. Given this world conditions, Russia's oil and gas companies are trying to increase the amount of their exports. Currently, the energy sector accounts for more than 50% of the country's exports, and Russia (not an OPEC member) has become the largest oil exporter in the world.

**Figure 2.3 Russian Export and Import by Commodity in 2002**




Source: Goskomstat, 2003

**Table 2.1 Russian Energy Export/Import, USD million**

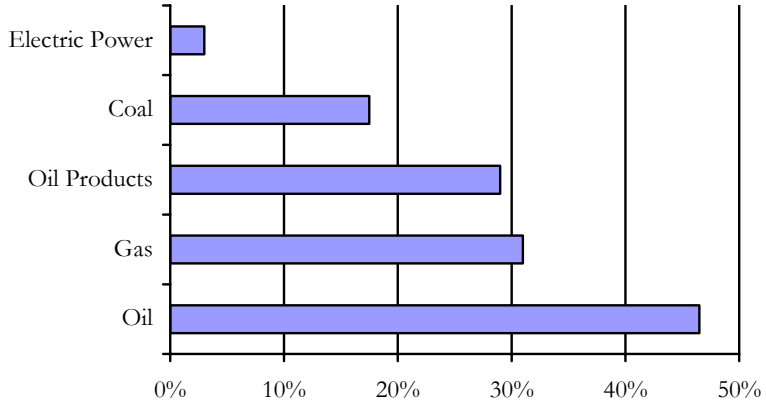
| *# HS* | *Article* | *2000* | | *2001* | | *2002* | | *2003* | |
|---|---|---|---|---|---|---|---|---|---|
| | | Export | Import | Export | Import | Export | Import | Export | Import |
| 270900 | Petroleum oils and oils obtained from bituminous minerals, crude | 23,644 | 616 | 24,562 | 460 | 27,445 | 444 | 36,841 | 487 |
| 271000 | Petroleum oils & oils obtained from bituminous minerals, o/than crude etc | 10,711 | 80 | 9,402 | 106 | 11,139 | 117 | 13,927 | 160 |
| 271121 | Natural gas in gaseous state | 16,823 | 541 | 17,766 | 39 | 15,358 | 117 | 17,388 | 138 |
| 270112 | Bituminous coal, whether or not pulverized but not agglomerated | 1,052 | 3 | 1,088 | 5 | 1,022 | 7 | 1,548 | 40 |
| 271600 | Electrical energy | 138 | 10 | 210 | 31 | 252 | 53 | 415 | 88 |

Source: UN statistics (COMTRADE), 2004

The export share is particularly high in the oil and gas industries. Russian oil and gas companies, however, are limited in their exporting opportunities – the government obliges them to satisfy the needs of the domestic market, where the prices are significantly lower (by 4 to 8 times depending on the product, although the domestic rates are growing, and the gap is gradually narrowing) than in Europe. This situation is explained by the necessity to support Russian producers in all sectors during the transitional period in Russia's economy.

For coal companies, export opportunities are closely connected with the transportation tariffs, mainly for the state-monopolized railway transportation. Currently, these tariffs are low, and, for example, companies of Kuzbass, the main coal region in the South of Siberia, have an opportunity to export their products to Europe.

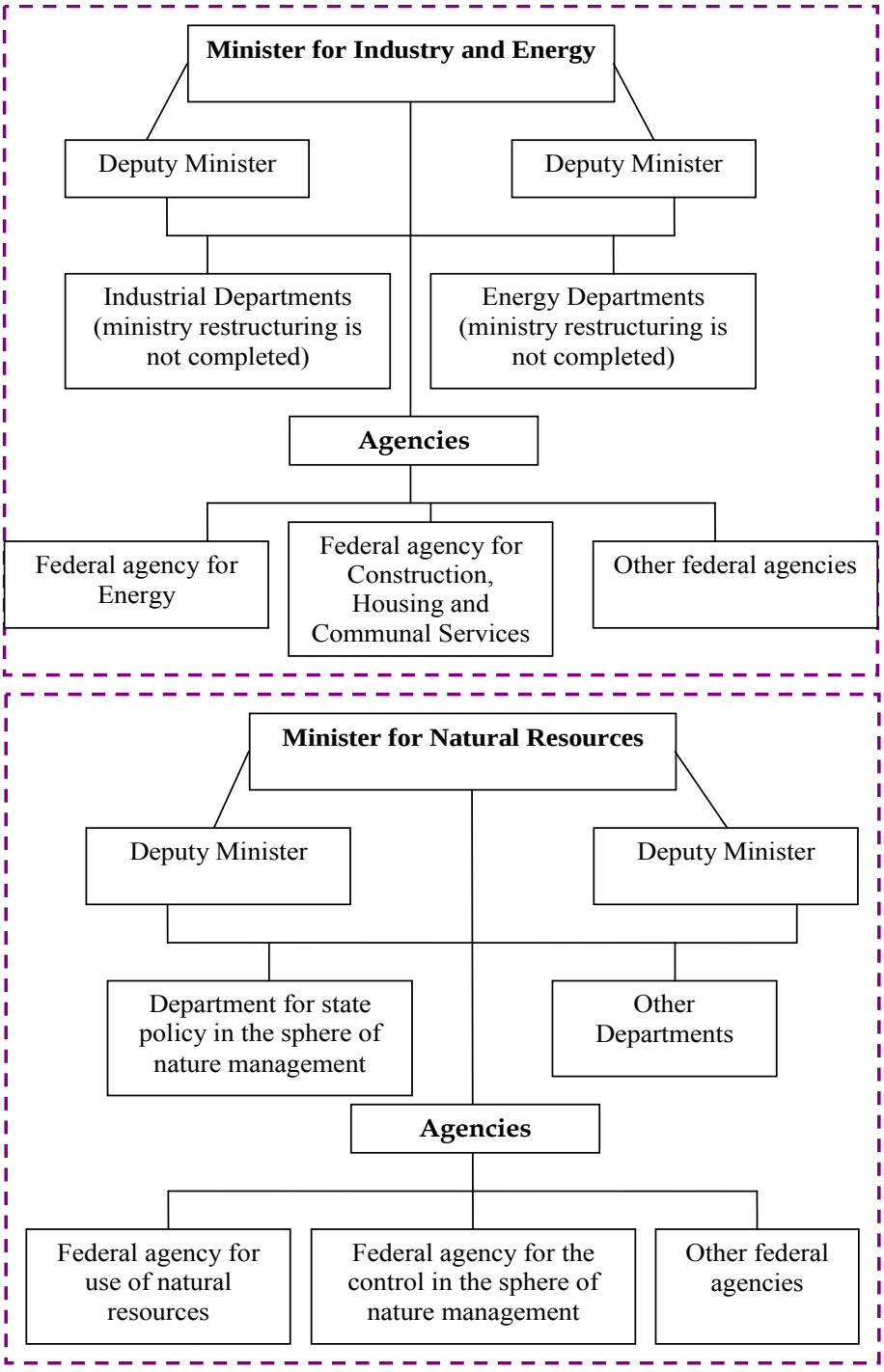
**Figure 2.4 Energy Exports in 2001, % of Production**




Source: Goskomstat, 2003

The state possesses a lot of means to influence the energy sector. The government owns share holdings (including majority holdings) in many companies, all main pipelines and power transmission lines, regulates export and import tariffs and quotas, as well as tariffs for railroad transportation, and establishes the basic rules for the use of natural resources. Priorities in the choice of regulating instruments have varied during the recent years, because of changes in the federal government. Currently, the distribution of powers looks as follows.

**Figure 2.5 Government Regulation Bodies in Energy Cluster**



Among Russia's industrial sectors, the energy sector can be marked as the most state-regulated. The liberalization process, however, is gradually taking pace in this sector as well, and the influence of the government on economic activities is decreasing little by little. The competitive environment is still weak in general, however, and is not developing quickly enough, and this is one of the specific features of the Russian energy sector.

The Russian markets of many related and supporting industries important for the energy sector, such as *prospecting, maintenance, banking, finance, environmental protection, logistics, ICT*, are still underdeveloped. Large energy companies cannot get necessary goods and services of high quality at the competitive market, and that is why they have to rely mainly on their own subdivisions providing such goods and services. Currently, outsourcing policy is comprehensively implemented only by oil companies. While domestic suppliers are weak, they use their sufficient financial opportunities to buy the necessary goods and services at international markets. In future, the development of related and supporting industries will, no doubt, become an important element of the development of the sector as a whole and turning it into a working cluster.

Among the most important present-day trends in the development of the Russian energy sector, the following should be mentioned:

- Economic upturn in Russia and the growth of world prices for energy products (primarily for oil) support the development of energy branches.
- The gap between Russian domestic energy prices and prices at the world market remains, but is gradually narrowing.
- Foreign companies started a new stage of entering the Russian oil market.
- Russian biggest energy companies search to strengthen their positions abroad, mainly in the former Soviet countries and in Eastern Europe.
- The level of state regulation of different types of activities is still high, but is gradually decreasing.
- Monopolies and oligopolies dominate at Russian energy markets.
- New hydrocarbon deposits are being prepared for and put into operation.
- New pipelines and sea terminals are being constructed for exporting crude oil and oil products.
- Oil refineries facilities are being modernized.
- Outsourcing policy is used wider in the oil industry.
- Electric power market is being restructured.
- Power engineering companies are searching for new strategies.

Different energy industries have their specific features and sometimes significantly differ in their dynamics. That is why we will further consider every branch separately, having in mind that the branches are linked not only within the fuel balance (the growth in the share of one kind of fuel leads to the decrease of the others), but also through other mechanisms: common related and supporting industries, common patterns of development, existence of holding companies which include companies of different energy industries, etc.

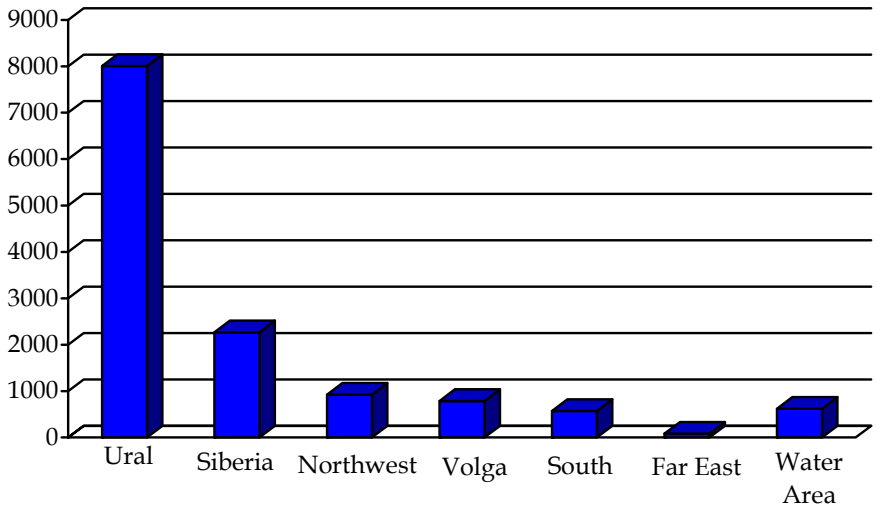
## 2.1 Oil Industry

The oil industry (it includes extraction, transportation and refining of oil) is the leading and the most successful segment of the Russian energy sector. Its products provide the most of Russia's exports and have a stable high demand at the domestic market.

**Figure 2.6 Russian Oil Industry Map**

Russia's main petroleum reserves are situated in Western Siberia, which is part of Urals Federal District of Russia. Large oil fields are also situated in Eastern Siberia (Siberian Federal District), but their operation is actually just starting. The large oil fields closest to Europe are situated in the Northwest of Russia. They are concentrated in the Komi Republic and in Nenets Autonomous Region, as well as in the Barents and Kara Seas.

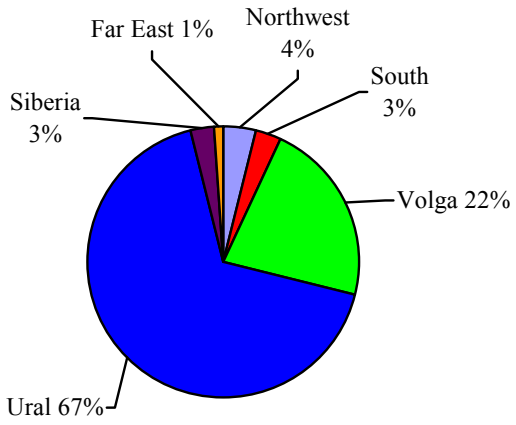
**Figure 2.7 Oil Reserves by Federal District of Russia, mln. tonnes**




Source: VNIGRI (All-Russia Oil Prospecting Institute), 2002

The Urals Federal District occupies the leading position in oil extraction in Russia: about two thirds of the total national output. The second largest oil-extracting region is the Volga Federal District, where the reserves are significantly smaller. Other federal districts only account for about 10% of oil extraction in Russia, but the Northwest can increase its share in the nearest future due to the development of new deposits.

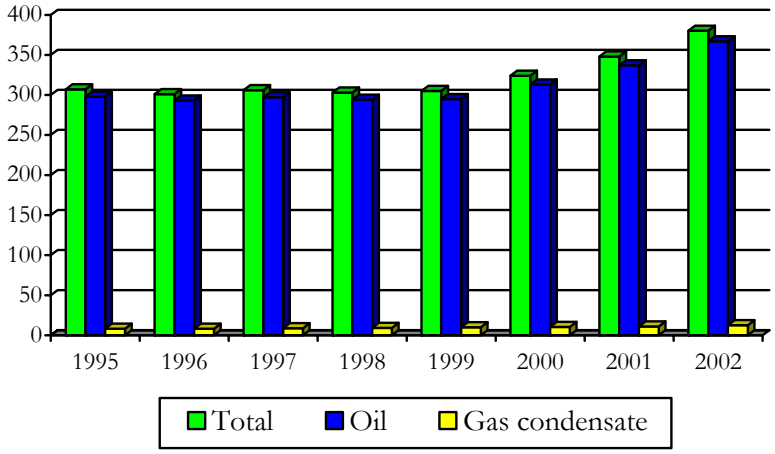
**Figure 2.8 Oil Production by Federal District of Russia in 2002**




Source: Goskomstat, 2003

Since 2000, oil extraction in Russia has been noticeably growing. High world market prices stimulate companies to extract and export more. Thus, financial resources are being accumulated, which lays the foundation for current modernization and future development.

**Figure 2.9 Oil Production in Russia, mln. tonnes**




Source: Goskomstat, 2003

Petroleum refining plants are concentrated in the European part of Russia and in several large cities in Siberia and the Russian Far East. They are connected with oil fields by pipe lines. All Russian petroleum refiners are part of big oil holding companies, and the actual use of their capacities largely depends on the amounts of extraction and on the policies of these mother companies. Many refineries have been modernized in recent years with the view to increasing exports of oil products.

**Table 2.2 10 Largest Oil Refineries in 2003**

| *Refinery* | *Owner* | *Region* | *Production, mln. tonnes* | *Capacity, mln. tonnes per year* |
|---|---|---|---|---|
| **Kirirshinefteorgsintez** | Surgutneftegas | Leningrad | 15.2 | 17.3 |
| **Omsk** | Sibneft | Omsk | 13.8 | 19.5 |
| **Nizhegorodsky** | Lukoil | Nizhny Nov-gorod | 11.8 | 15.0 |
| **Yaroslavnefteorgsintez** | Slavneft | Yaroslavl | 11.5 | 14.0 |
| **Permnefteorgsintez** | Lukoil | Perm | 11.0 | 12.0 |
| **Ryazan** | TNK-BP | Ryazan | 10.7 | 18.0 |
| **Angarsk** | Yukos | Irkutsk | 8.2* | 19.2 |
| **Ufa** | Bashteftekhim | Bashkortostan | 7.4* | 11.7 |
| **Novokuibyshevsk** | Yukos | Samara | 6.9* | 9.6 |
| **Novo-Ufimsky** | Bashteftekhim | Bashkortostan | 5.4* | 14.7 |

* Data for 2002
Source: data provided by companies, Strategy Priorities of Russian Oil Refining Companies, Moscow, 2002.

The rapid development of Russia's oil industry has also been reflected in recent years in development of new oil fields, construction of new pipe lines and oil terminals. Thus, new oil and oil products capacities have been put in operation in the biggest Russian ports of Novorossiysk (Black Sea) and St. Petersburg (Gulf of Finland), as well as in the ports of Tuapse (Black Sea) and Vysotsk (Gulf of Finland). New oil ports have been constructed in Primorsk (Gulf of Finland) and Varandey (Barents Sea). The general conclusion is that the development mainly concerns the infrastructure for supporting the growing exports of oil and oil products.

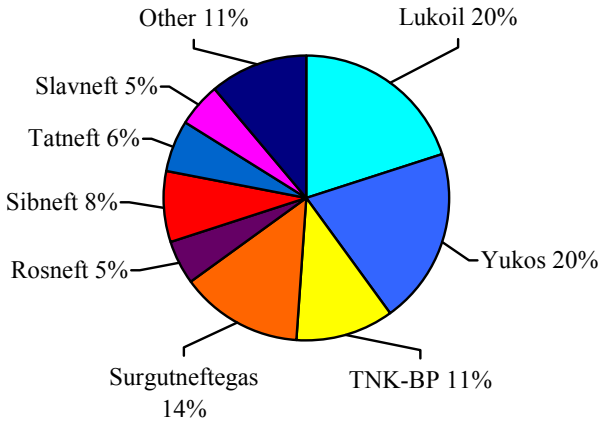
The Russian oil industry is mainly privatized. Only one large company, Rosneft, remains in the state ownership. Another big state company, Transneft, however, manages all main pipelines, which allows the government to control the whole oil sector. Currently only local pipelines (from oil rigs to main pipelines) are in the ownership of companies.

**Table 2.3 Largest Oil Companies in Russia**

| *Company* | *Sales in 2002, USD million* | *Production in 2003, mln. tonnes* |
|---|---|---|
| **Lukoil** | 15,449.0 | 81.5 |
| **Yukos** | 11,373.0 | 80.7 |
| **Surgutneftegas** | 6,407.7 | 54.0 |
| **TNK-BP** | 6,075.4 | 42.96 |
| **Sibneft** | 4,776.7 | 31.39 |
| **Tatneft** | 3,465.9 | 24.66 |
| **Slavneft*** | 2,718.7 | 18.1 |
| **Rosneft** | 2,669.0 | 19.56 |

*In the beginning of the year 2003 Slavneft was bought by consortium of TNK-BP and Sibneft
Source: Expert RA, 2003, RosBusinessConsulting, 2004

**Figure 2.10 Oil Production (tonnes) by Companies in 2003**




Source: RosBusinessConsulting, 2004

Of a large number of private oil companies that appeared during the first stage of privatization in the 1990s, only several largest players remain today as a result of numerous mergers and acquisitions. The Russian oil market (oil fields, refineries, major consumers) is practically

divided between them. The leading oil companies are one of the most powerful and influential players of the Russian corporate sector, and expand their business abroad very actively. The same companies, however, can become subject to state persecution due to a number of «disputable» aspects in the history of their development (a typical example – the so-called "Yukos case", the real reasons for which are still not clear).

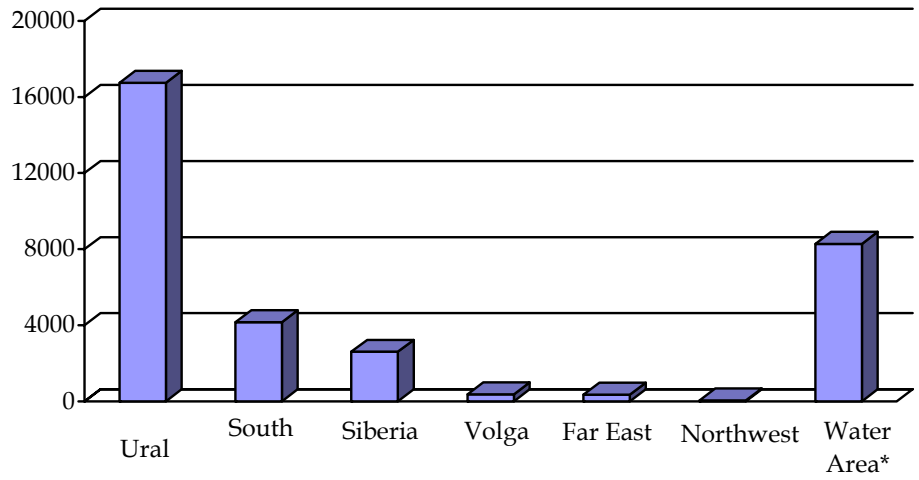
However, despite high entrance barriers, the Russian oil business is considered quite attractive by international experts, especially in connection with the development of new oil fields. Thus, in 2003, the biggest European oil company, British Petroleum, acquired the assets of the Russian company TNK, which was the largest transaction in the whole history of Russian business.

## 2.2 Gas Industry

Gas industry products have large and still growing domestic demand (many regions of Russia do not yet have gas supply), and at the same time account for the second most significant component of Russia's export. Currently, Russia is the biggest natural gas producer in the world.

The biggest reserves of natural gas in Russia are concentrated in the north of Western Siberia (Urals Federal District), and the largest share of gas – nearly 90% of Russia's total – is extracted at the four biggest deposits located there. Also, big gas deposits have been prospected in the Barents and Kara Seas. The beginning of their exploitation is planned for the medium-term, and will probably take place with the participation of foreign companies.

**Figure 2.11 Gas Reserves, billion $m^3$**




* 75% - Barents and Kara Seas
Source: VNIGRI (All-Russia Oil Prospecting Institute), 2002

Extraction, pipeline transportation and refining of natural gas in Russia are practically monopolized by the state controlled company, Gazprom. Gazprom is the biggest industrial company in the country, and actively invests in gas transportation and other energy assets abroad. The second largest player in the Russian gas market is a private company Itera, which was set up in the 1990s. Itera deals with export-import operations, and, starting with the middle of the 1990s, extracts natural gas, but the volumes cannot yet be compared to those of Gazprom.

**Figure 2.12 Russian Gas Industry Map**

**Table 2.4 Largest Gas Companies in Russia**

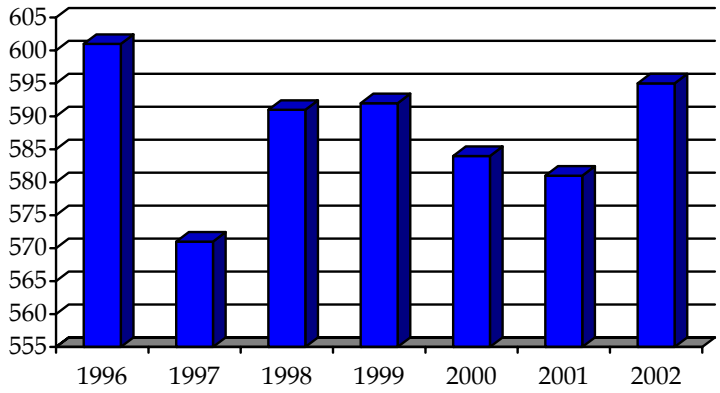
| *Gas Companies* | *Sales in 2002, USD million* | *Production in 2003, billion cubic meters* |
|---|---|---|
| Gazprom | 19,571.0 | 540.2 |
| Itera | n/a | 30.7 |

Source: Expert RA, 2003, RosBusinessConsulting, 2004

Gazprom restructuring, with the view to its demonopolizing, will start not earlier than in 2008, after the completion of the electric power sector reform. Such order is conditioned by the government's intention to mitigate the transfer to market prices for domestic consumers.

Apart from natural gas, oil gas is also extracted, and amounts to about 5% of all gas production in Russia. It is extracted by oil companies that prefer refining oil gas locally.

**Figure 2.13 Gas Production, billion $m^3$**




Source: Goskomstat, 2003

Gazprom's monopoly impedes attracting direct foreign investments to the gas business, but the situation is changing, especially as developing new deposits is needed. Thus, joint development of gas deposits in the Barents Sea looks quite likely.

## 2.3 Electric Power Industry

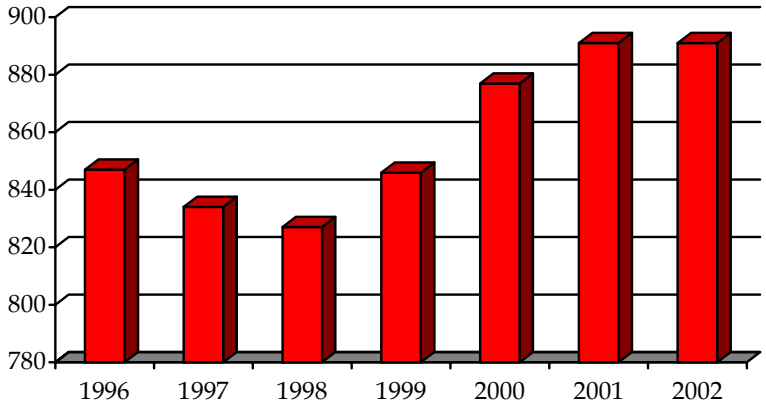
The basis of the Russian electric power industry is formed by big power plants, situated close to industrial centers. Nearly all electric power produced is consumed domestically. The current exports are small, but have possibilities to grow due to the development of transmission lines, adapting Russian electric standards to the international norms and constructing new generating capacities.

Small power capacities produce mainly heat energy for the needs of municipalities and enterprises. There is a noticeable lack of such capacities for power production (dispersed energy production) for local consumption, which makes companies of all economic sectors dependent on large producers.

**Figure 2.14 Russian Electric Power Industry Map**

One of the weaknesses of the Russian electric power sector is insufficient development of transmission networks. In the majority of regions the density of networks is low, and their capacity does not provide for full-scale use of some big power plants. In the Russian Far East, the networks are fragmented and not connected with the unified system of the rest of Russia.

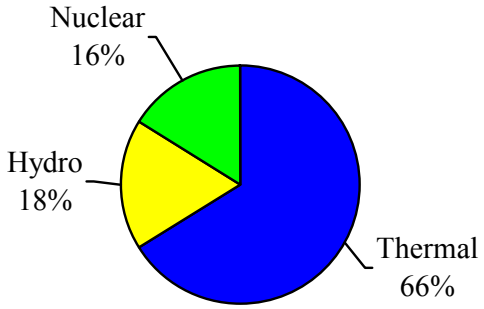
**Figure 2.15 Electric Power Production, billion kWh**




Source: Goskomstat, 2003

On the whole, electric power production in Russia is closely linked to rises and falls in industrial output. About two thirds of all electric power is produced at thermal power plants, which mainly use natural gas, coal and black oil as fuel. The rest of electric power is produced at hydroelectric and nuclear power plants.

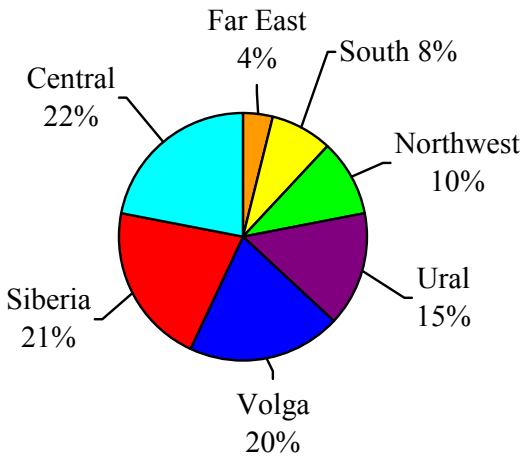
**Figure 2.16 Electric Power Production by Type of Power Plant in 2002**




Source: Goskomstat, 2003

In the Central Federal District of Russia, thermal and nuclear power plants prevail, in the Northwestern District – nuclear power plants, in the Siberian and Volga Federal Districts – hydroelectric and thermal power plants, in the Urals, Southern and Far Eastern Districts – thermal power plants.

**Figure 2.17 Electric Power Production by Federal District in 2002**




Source: Goskomstat, 2003

At the present time, two state-controlled companies dominate at the Russian electric power market: RAO UES of Russia and Rosenergoatom. RAO UES of Russia is the second largest Russian industrial company after Gazprom in terms of sales. It is the owner of all large power plants, apart from nuclear ones, and of all transmission lines. Rosenergoatom manages all ten Russian nuclear power plants. Small energy capacities producing thermal and electric energy are mainly owned by municipalities and enterprises.

**Table 2.5 Largest Electricity Companies in Russia in 2002**

| *Company* | *Region* | *Sales, USD million* | *Power Generation, mln. kWh* |
|---|---|---|---|
| **RAO UES of Russia** | All regions | 16,052.6 | 635.8 |
| Of this: Mosenergo | Moscow and Moscow Region | 1,714.0 | 71.1 |
| Tyumenenergo | Tyumen | 1,119.0 | 63.4 |
| Lenenergo | St. Petersburg and Leningrad Region | 729.0 | 16.7 |
| Sverdlovenergo | Sverdlovsk | 702.0 | 36.8 |
| Bashkirenergo | Bashkortostan | 521.0 | 23.6 |
| Tatenergo | Tatarstan | 496.3 | 20.1 |
| Kuzbasenergo | Kemerovo | 484.0 | 27.1 |
| Samaraenergo | Samara | 475.0 | 13.5 |
| **Rosenergoatom** | Several regions | 1,944.3* | 148.6 |

* Data for 2003
Source: data provided by companies

Currently, RAO UES of Russia is undergoing restructuring with the view to demonopolizing and creating competitive electric power markets. This reform is going to take several more years. As planned, the single giant company will be divided into smaller companies, working at the local Russian markets. The spheres of production and sales of electric power will be privatized, but the

government is going to keep the control over the transmission infrastructure. One of the results of the reform (according to experts' estimates) will be creation of preconditions for foreign companies necessary to enter the Russian electric power market.

## 2.4 Power Engineering Industry

The Russian power engineering industry specializes in producing machines and equipment for large power plants of all types, and equipment for extracting and transporting of hydrocarbons and other energy resources. The main centre of this industrial segment is St. Petersburg, where many large plants (Izhora Plant, Leningrad Metal Plant, Elektrosila, Turbine Blades Plant, Nevsky Plant) are situated. Another big power engineering centre is Ekaterinburg (Uralmash Plant). Currently, two holding companies (they comprise all above-mentioned and some other plants) dominate at the Russian power engineering market: Silovye Mashiny and OMZ, which have nearly the same market weight.

**Table 2.6 Largest Power Engineering Companies in Russia**

| ***Power Engineering Companies*** | ***Sales in 2003, USD million*** |
|---|---|
| OMZ (United Machine Building Plants) | 546.2 |
| *Uralmashzavod* | 153.4* |
| *Izhorskie Zavody* | 149.4 |
| Silovye Mashiny (Power Machines) | 352.3 |
| *LMZ* | 112.5 |
| *Elektrosila* | 97.9 |
| *Zavod Turbinnykh Lopatok (Turbine Blade Plant)* | 29.6 |

* Data for 2002
Source: Expert RA, 2003

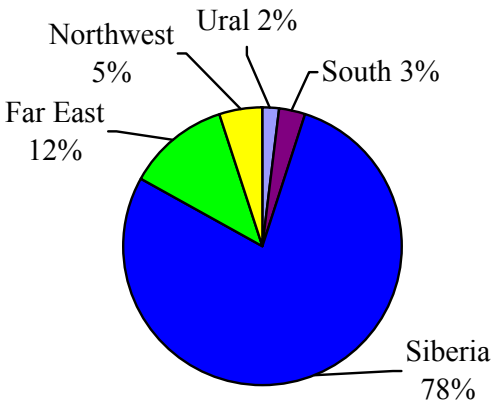
Over the last ten years, the domestic market of Russian producers has been very limited, because RAO UES of Russia invested very little into creating new generation capacities and modernization of old facilities. This led to a sharp decrease in their output. The number of export orders (mainly from developing countries – China, India, Iran) also decreased, but their occurrence helped the Russian power engineering companies to partially preserve their competitiveness. Last years St. Petersburg producers also got some orders for hydraulic equipment from Finnish-Sweden Fortum.

At present, when the Russian energy sector is growing, power engineering companies again have domestic contracts, yet mainly with oil and gas industries. For the necessary modernization of production facilities, however, big investment is needed. This problem is being solved by further consolidation of assets inside the branch and search of opportunities for cooperation with large Western producers. For example, Silovye Machiny is going to be acquired by German Siemens. The on-going electric power industry reform also provides for good opportunities for development of Russian power engineering companies.

## 2.5 Coal Industry

The Russian coal industry extracts two types of coal: energetic coal and coking coal. The first (about 40% of total extraction) is used at electric power plants to produce electricity and heat, mainly in three Federal Districts of Russia – Siberia, Far East, and in some regions of Northwest, where there are still no gas pipelines. The second (about 60% of total extraction) is consumed by big steel plants.

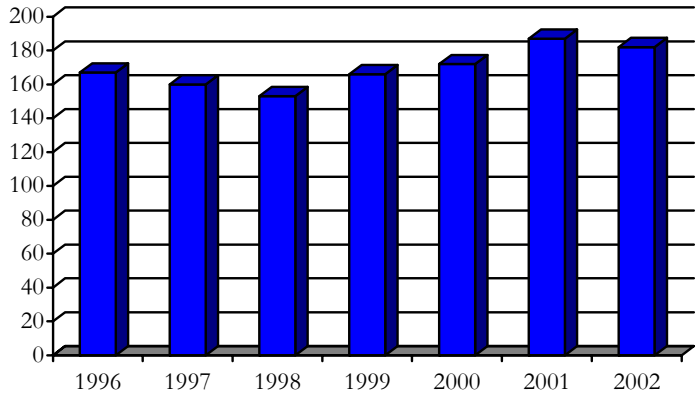
**Figure 2.18 Coal Production by Federal District of Russia in 2002**




Source: Goskomstat, 2003

In the European part of Russia (less than 10% of the total coal production in Russia), coal is extracted at Pechora coal-field in the Komi Republic (Northwest Federal District) and Donets coal-field (Donbass) in the Rostov Region (Southern Federal District). The main Russian coal extraction (including the coal for export) is carried out at Kuznetsk coal-field (Kuzbass) in the south of Siberia. More than two thirds of the Russian coal is produced there.

**Figure 2.19 Coal Production, mln. tonnes**




Source: Goskomstat, 2003

The coal industry is characterized by low profitability. Only the most successful companies are privatized, others are still controlled by local or federal authorities. The leading Russian steel corporations are among big shareholders of the companies extracting coking coal.

The long-term federal program of restructuring of the coal industry sets up the goal of increasing productivity and decrease in labor intensity.

Opportunities for wider use of energetic coal are mainly connected with potential changes in the fuel balance (for example, as a result of possible reduction in natural gas extraction) and with the development of new, more environmental friendly, combustion technologies.

The weight of shale oil and peat industries in the Russian energy sector is currently close to zero. Low-calorie fuels, shale oil and peat are currently not used at large power plants. The possibilities of their wider use are mainly connected with the expected (as a result of electric power industry reform) active development of dispersed energy production in Russia, which will search to use all local fuels to the maximum.

Finalizing this chapter, we emphasize main **challenges for the Russian energy sector**, which could make a serious impact on its development in the medium perspective:

***Fluctuations of world prices for energy products***

Currently, world oil prices have reached their historic maximum, and, according to many experts, will continue to grow. This provides many oil companies with the opportunity to accumulate sufficient financial resources, thus providing for their sustainable middle-term development.

***Monopoly restructuring***

Restructuring huge state monopolies, RAO UES of Russia and Gazprom, will be carried out in turns, and not simultaneously, to mitigate possible difficulties, connected with the market liberalization, for domestic consumers. The process of demonopolization will be accompanied by creating different new opportunities for Russian and foreign businessmen.

***Large investment is needed for increase in production and export of energy products***

To significantly increase production in the energy sector, large investment is needed for development of new deposits, modernizing production facilities, supporting and developing transport infrastructure, including pipelines, electric power transmission lines and railroads. An important reserve in increasing export value is producing more goods with higher value added, which demands building new refining facilities and reconstructing old ones. Large-scale projects will necessarily need attracting foreign partners.

***The need for development of dispersed energy production***

Creating on-site small energy facilities can significantly reduce companies' dependence on large suppliers of electric power and heat energy. This is particularly important in connection with the electric power industry reform currently under way and with the possible temporary problems with sustainable energy supply. The dispersed energy production segment seems quite promising for foreign companies, mainly for producers of the relevant equipment.

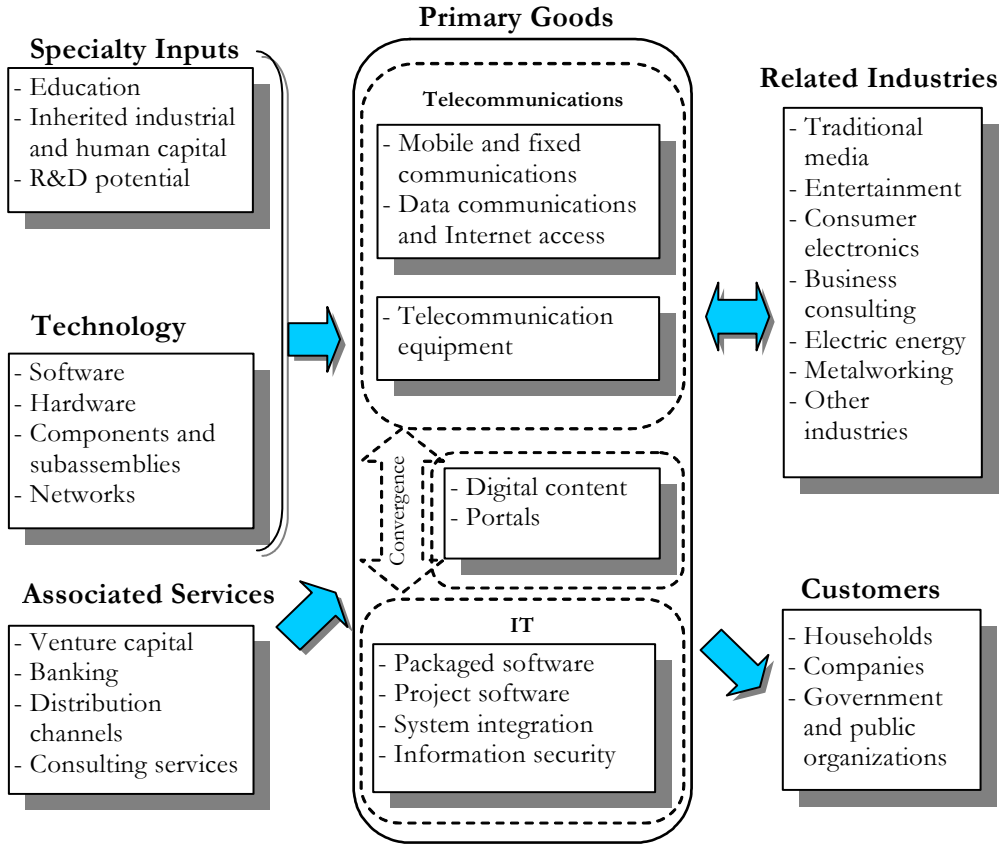
***Environmental protection***

Currently, the energy sector is the largest source of environment pollution in Russia. Energy companies try to save on environmental costs, while the government does not yet pay enough attention to this important aspect. In future, under the pressure from public organizations, companies' environmental costs will inevitably grow.

# 3. ICT CLUSTER

The sector of information and communication technologies (ICT) is one of the most rapidly growing in the Russian economy. Its development is primarily caused by the active domestic demand for the traditional and new products and services. The ICT sector is a rather new economic formation, and many of its segments have emerged only during the last decade, that is, already against the background of the Russian market reforms. That is why this sector is rather less dependent on the legacy of the Soviet period, and the development of some its segments was from the start conditioned by the free market environment. It can be claimed that the Russian ICT sector displays more characteristics of a working cluster than the most of traditional industries of the country. It plays also an important role in the integration of the Russian economy into the international networks.

**Figure 3.1 The Russian ICT Cluster Chart**




The data provided by today's Russian statistics is often insufficient for detailed analysis of intra-cluster relationships and specific elements of the ICT cluster. Especially scarce is information on the segment of information technologies and generally on services developing in the crossing of various ICT segments. That is why most of the information presented below is related to the telecommunications segment which is better accounted for the Russian statistics.

The share of the ICT sector in current Russian economy is about 2-3%. This figure is twice as high in the two largest cities, Moscow and St. Petersburg, where it reaches about 5%.

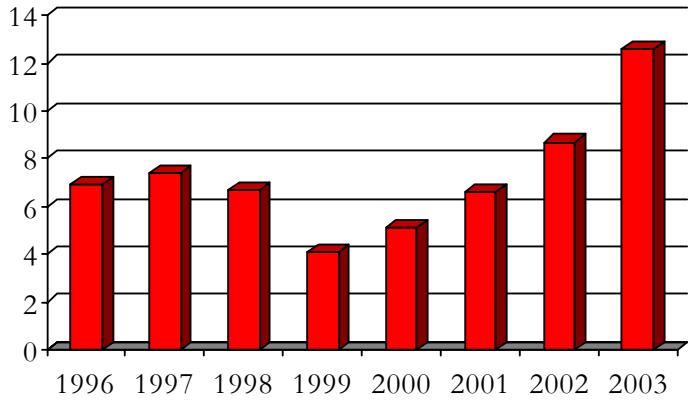
**Table 3.1 Share of Telecommunications in Russian Economy in 2002**

| | |
|---|---|
| Share in GDP, % | 1.8% |
| Employees, % | 1.7% |
| Fixed capital, % | 1.4% |
| Investments in fixed capital, % | 4.0% |
| Share of total services provided for inhabitants in Russia, % | 14.8% |

Source: Goskomstat, 2003

According to expert estimates, telecommunications provide about 70% of all revenues in the Russian ICT sector. In 2003, the sales of this segment reached USD 12.4 billion, which is 42.4% higher than in 2002. The total share of all other segments of the cluster (primarily, IT and electronic equipment manufacturing) is now about 30%. Yet these segments have a huge potential for development, and in future their share is likely to grow.

**Figure 3.2 Russian Telecommunication Market, USD billion**

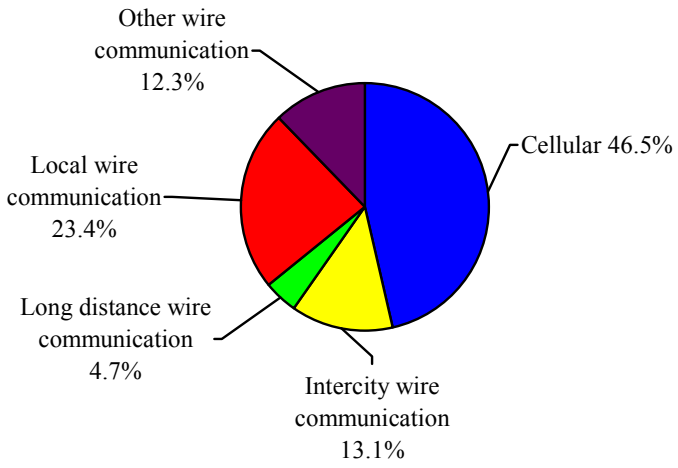



Source: Goskomstat, 2003

In the telecommunications segment, wire communications at present dominate over cellular communications, but the gap between them is rapidly decreasing, with the rate of growth of the latter often exceeding 100% annually over the last few years. Still, despite such impressive growth rates, only the markets of Moscow and St. Petersburg have already reached near-saturation, while other regional markets maintain high rates of development.

The dynamics of development of the traditional and new telecommunications operators are vastly different. All major traditional operators were in business back in the Soviet times, and now they are part of the government-controlled holding company, Svyazinvest. Svyazinvest owns over 90% of all wire communications infrastructure in Russia, and for a long time was a practical monopolist in this sphere. At present, the company undergoes restructuring and privatization, which will continue for the period of two to three years. The state also owns the Cosmicheskaya Svyaz (Space Communications) company that operates Russian communications satellites.

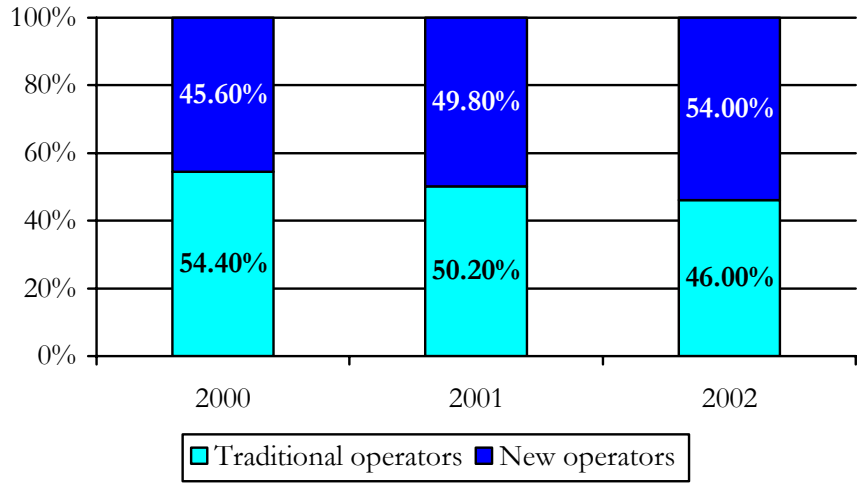
**Figure 3.3 Sales by Type of Telecommunication in 2003**




Source: Goskomstat, 2004

New operators appeared in Russia after 1990. These are private companies that mainly specialize in new types of services with high value added: cellular communication, digital telephony, phone packages for corporate applications, data transmission, etc. New operators grow much faster than their traditional counterparts, due to their client orientation, application of modern management methods and business models, and high rate of investment in development of their business. The growth of traditional operators is hindered, in particular, by low tariffs for wire communications that are strictly controlled by the state.

**Figure 3.4 Share of New and Traditional Operators on Russian Telecommunication Market**




Source: Goskomstat, 2003

There is also the third category of telecommunications operators. That is the communications departments of major oil and gas companies, which provide substantial volumes of services that are not accounted for the Russian statistics within the ICT sector. Further develop-

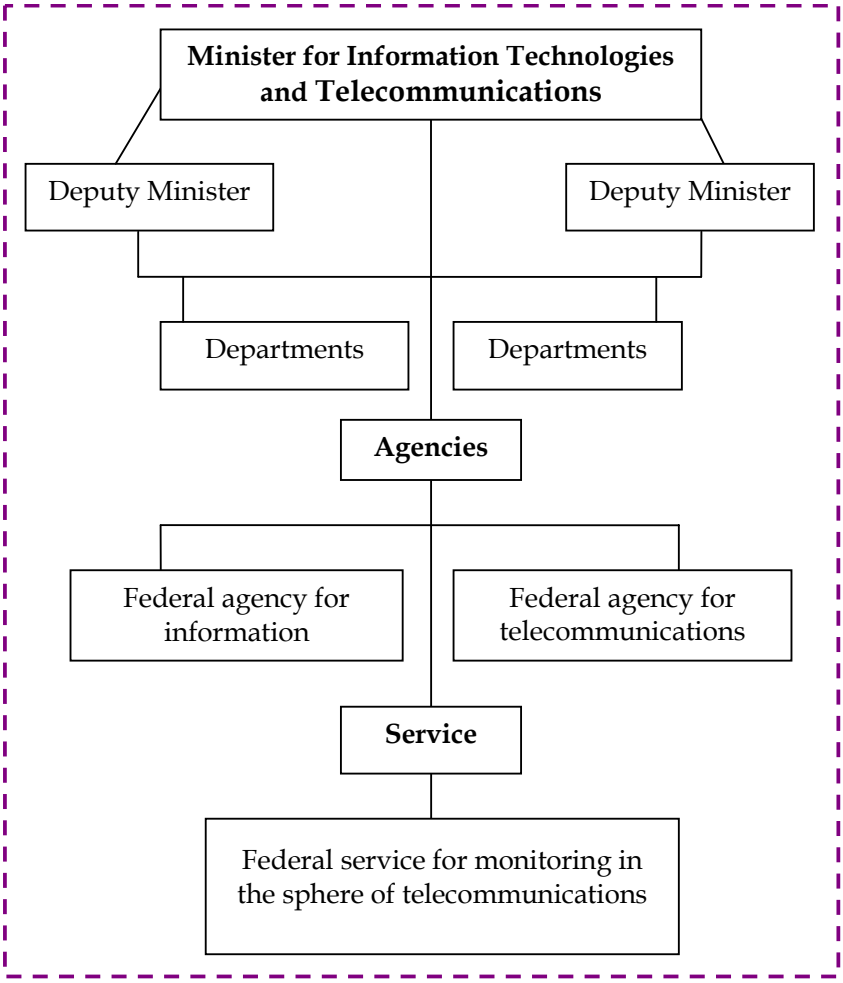
ment of the market and the policy of outsourcing implemented by oil and gas companies may lead to the situation when these operators enter the public market.

**Table 3.2 Largest Russian Telecommunication Companies**

| *Company* | *Region* | *Specialization* | *Sales in 2002,USD million* |
|---|---|---|---|
| Svyazinvest | All regions | Wire communications | 3677.8 |
| MTS | Most regions | Cellular communications | 1361.8 |
| Vympelcom | Most regions | Cellular communications | 779.6 |
| Megafon | Most regions | Cellular communications | 409.0 |
| Golden Telecom | Many regions | Wire communications | 198.7 |
| Transtelecom | Many regions | Wire communications | 100.0 |
| MTU-Inform | Moscow | Internet services | 89.0 |
| Bashinformsvyaz | Bashkortostan | Wire communications | 81.2 |
| MTU-Intel | Moscow | Internet services | 70.1 |
| Combellga | Some regions | Wire communications | 65.0 |

Source: CNews, 2004

**Figure 3.5 Government Regulation Bodies in ICT Cluster**



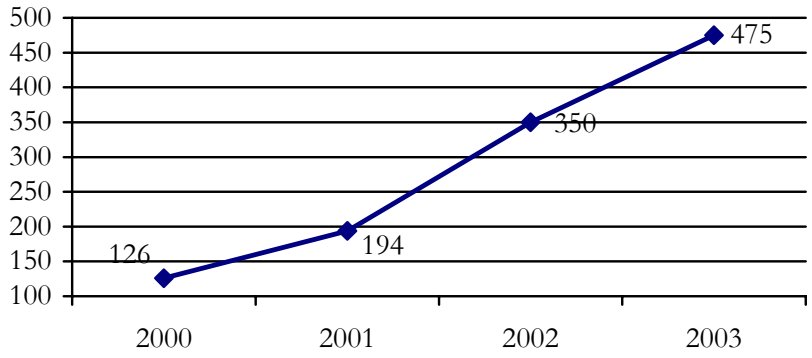
The Russian government has already many times declared its plans to support the development of high technology industries, including the ICT sector. These intentions have not been actively implemented in practice, but the first steps have already been made, for example, the government elaborated the mid term (up to 2010) program Electronic Russia (e-Russia) aimed at the development of information networks and implementation of information technologies in the country. This program is focused on computerization of educational institutions of all levels and development of informational educational technologies, as well as computerization of government agencies.

The models of state regulation have changed several times over the last few years following the changes in the structure of the Russian federal government. At present, the regulatory responsibilities are distributed in the following manner:

On the whole, direct government regulation is significant only in the wire communications segment, but even in this sphere new operators enter the market, and competition is growing. The planned reform of Svyazinvest will surely provide a new impetus to this process. In other segments, the competitive environment has already been established, and government regulation is provided by mostly indirect methods.

Products and services of the Russian ICT cluster are offered mostly in the domestic market. The only significant export in this sphere is the supply of software products (offshore programming).

**Figure 3.6 Russian Exports of Software Products, USD million**




Source: CNews, 2004

Russia also exports electronic equipment components, but the volumes are not very high, unlike imports that have been growing at a stable rate over the last few years.

According to experts, the overall negative foreign trade balance of the Russian ICT sector may turn to positive already in the medium term due to higher output of electronic equipment, development of offshore programming and penetration of foreign markets by the Russian telecommunications operators.

**Table 3.3 Russian Export/Import of ICT Related Equipment, USD million – International Statistics**

| *# HS* | *Product* | *2002* | | *2003* | |
|---|---|---|---|---|---|
| | | *Export* | *Import* | *Export* | *Import* |
| 8517 | Electric apparatus for line telephony and line telegraphy | 15.05 | 695.81 | 21.30 | 697.02 |
| 8525 | Transmission apparatus for radio-telephony, radio-broadcasting | 30.25 | 536.48 | 29.00 | 610.57 |
| 8527 | Reception apparatus for radio-telephony, radio-telegraphy and radio-broadcasting | 3.27 | 135.32 | 3.57 | 149.82 |
| 9001 | Optical fibers and optical fiber bundles | 14.27 | 15.59 | 13.60 | 21.33 |

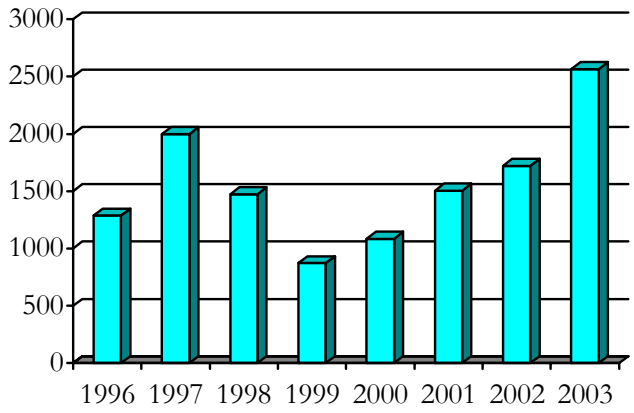
Source: UN Commodity Trade Statistics, 2004

**Table 3.4 Imports of Telecommunication Equipment to Russia, USD million – Russian Statistics**

| *Product* | *1999* | *2000* | *2001* | *2002* |
|---|---|---|---|---|
| Apparatus for phone communication | 349.2 | 398.2 | 635.7 | 688.2 |
| Broadcasting apparatus | 238.1 | 285.9 | 405.0 | 526.7 |
| Radio receiving equipment | 6.5 | 18.7 | 75.8 | 134.2 |
| Computers and components | 192.9 | 206.8 | 421.5 | 534.5 |

Source: Goskomstat, 2003

**Figure 3.7 Investments in Fixed Capital in Telecommunications, USD million**



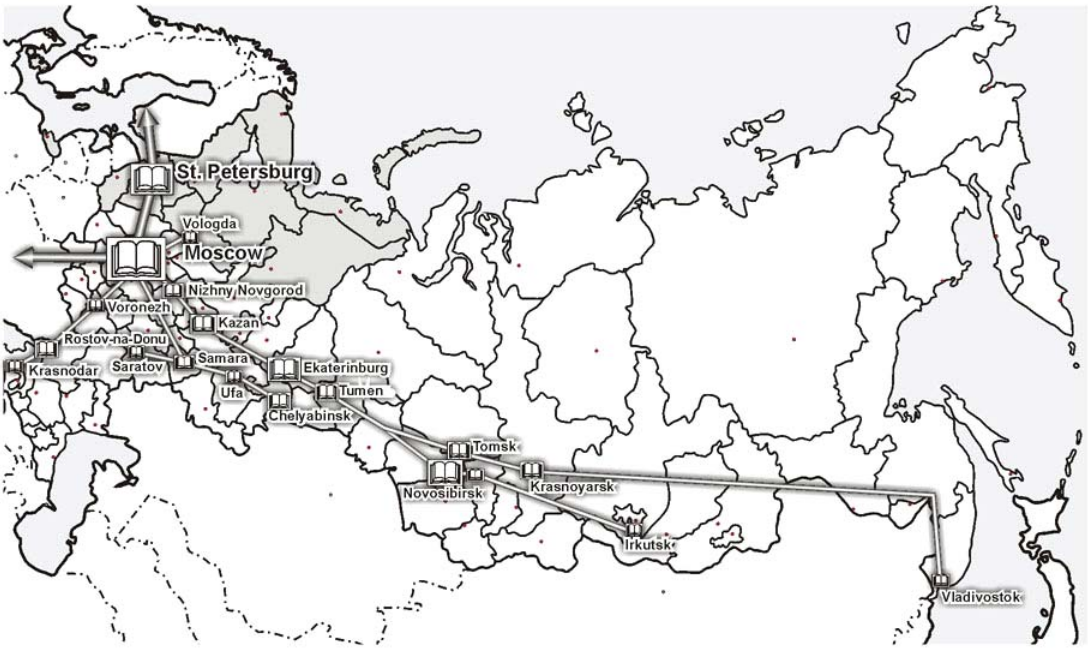

Source: Goskomstat, 2003

The Russian ICT sector is quite attractive for investors. Many large companies (especially in the sphere of cellular communications) were founded in the 1990s by foreign companies or with their active participation. Over the last years, the share of foreign capital in the Russian telecommunications segment has decreased, but domestic investors willingly took their place.

As a result, the investment in fixed assets has been constantly growing since 2000. Foreign companies also play an important role in other ICT segments: many leading international companies (Intel, Sun Microsystems, Siemens, etc.) opened their R&D centers in Russia.

The Russian ICT sector is characterized by a high degree of concentration. The main agglomerations are located in Moscow and St. Petersburg including the main educational centers of the country that possess sufficient young, qualified and motivated work force. At the same time, Moscow and Moscow region together are the largest domestic market of telecommunication and IT services, while St. Petersburg is the second biggest market. Over the last several years, due to gradual growth of incomes of the population and penetration of new technologies, there is a real boom in telecommunications markets in other regions of Russia.

**Figure 3.8 Main University Centers and University IT Networks**




Source: Ministry for Education, 2002

The number of graduates of universities and technical colleges in ICT related programs has been constantly growing. However, the country, like the rest of the world, experiences obvious deficiency of qualified specialists. Over the 1990-s, there was an active "brain drain" from Russia, including ICT specialists. At present, the standard of living in Russia is growing, and many young talented specialists manage to find well-paid jobs at home.

There are the following main trends in the current development of the Russian ICT cluster:

- The domestic demand for products and services of the ICT companies is constantly growing.
- The domestic market is still far from being saturated: the products and services penetrate not only the biggest markets of Moscow and St. Petersburg, but also the markets of other Russian regions.
- The Russian ICT sector is more and more integrated into the international ICT networks.

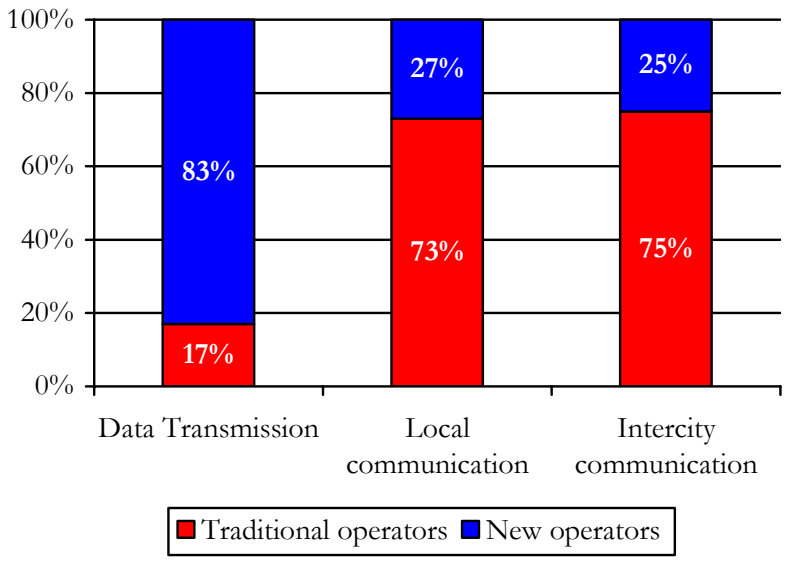
- After a certain decline, foreign investments in the Russian ICT sector have started to grow again.
- Domestic investment is also growing.
- State regulation in the segment of wire communications is gradually decreasing.
- The government has elaborated some programs for development of ICT networks in Russia.
- Competition is growing in all ICT segments.
- New technological solutions regularly appear in the market, the convergence of IT and telecommunications is growing.
- Cellular communications develop faster than traditional wire communications.
- Offshore programming services are rapidly developing in the university centers of Russia.
- Household electronic equipment assembly is developing fast.
- Imports of electronic equipment are much higher than exports.

Below is a short summary of all basic segments of the Russian ICT cluster describing important today's characteristics of them.

## 3.1 Wire communications

The wire communications segment is developing rather more slowly than the segment of cellular communications. The number of digital telephone exchanges in 2003 reached only 47% of the total number of telephone exchanges in the country, which also limits the development of other telecommunication services, such as Internet services provision (ISP). At present, Russia is dominated by dial-up Internet connection, and this situation is not likely to change in the nearest future. Modernization of networks owned by Svyazinvest is slowed down by the lack of financing, since the company provides low-price services dictated by the state. The introduction of time-based charges is still under discussion.

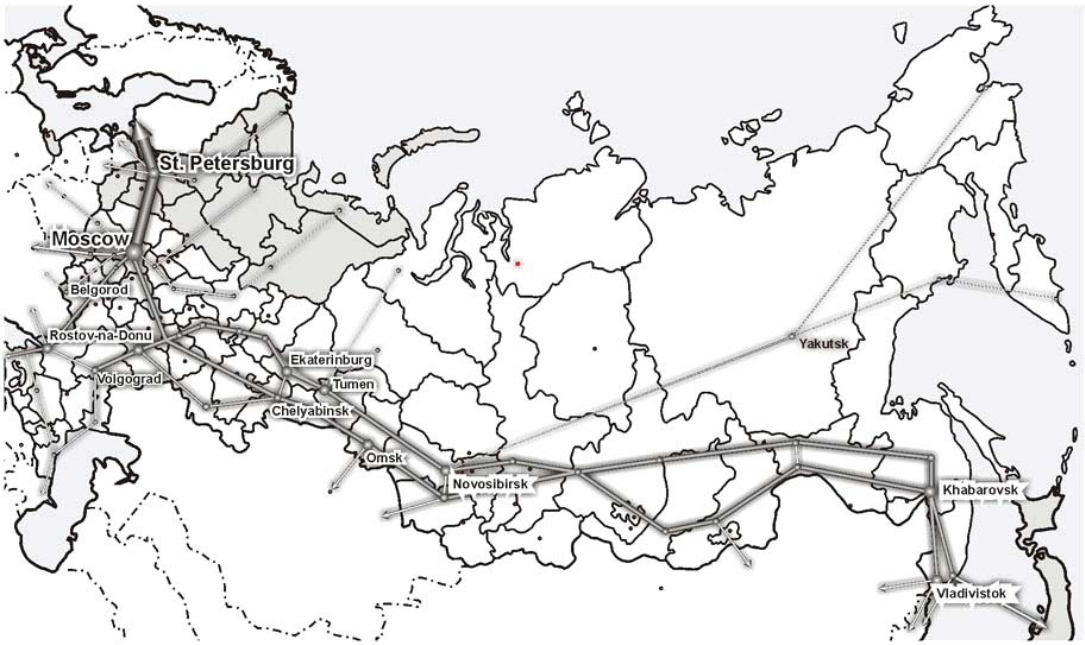
**Figure 3.9 Share of Traditional and New Operators on Wire Telecommunication Markets in 2003**




Source: CNews, 2004

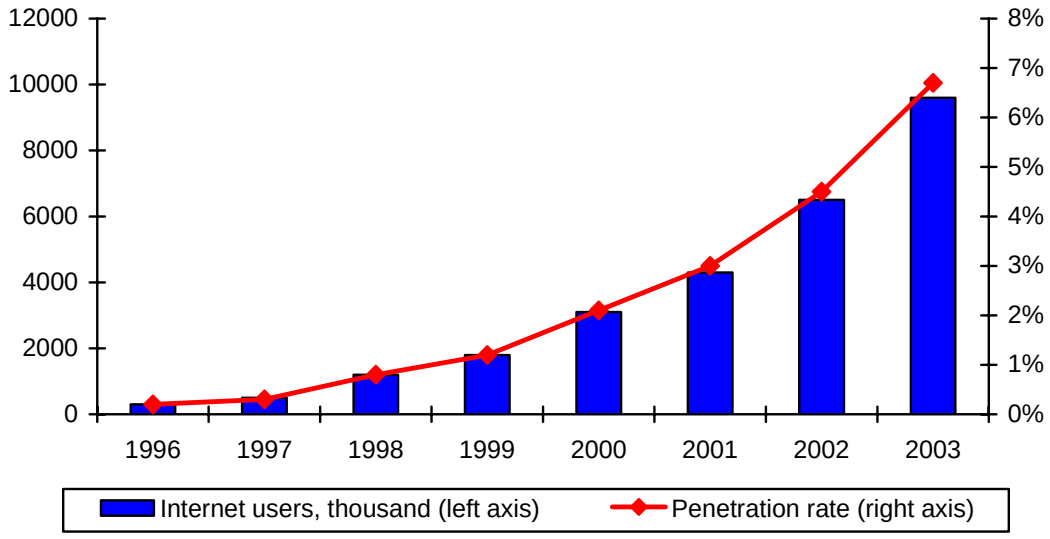
Other operators mainly specialize in new types of services: data transmission, ISP, IP-telephony, pre-paid card telephony, development of local networks for corporate clients and residential estates. All these services are provided for clients with the highest purchasing power. Recently, new operators have also started to penetrate the vast market of traditional wire phone services (local and intercity), but in this case they become dependent on the basic wire communications infrastructure owned by Svyazinvest.

**Figure 3.10 Main Data Transmission Lines in Russia**




Source: Ministry for communications, 2002

**Figure 3.11 Internet Users and PC Penetration Rate in Russia**




Source: CNews, 2004

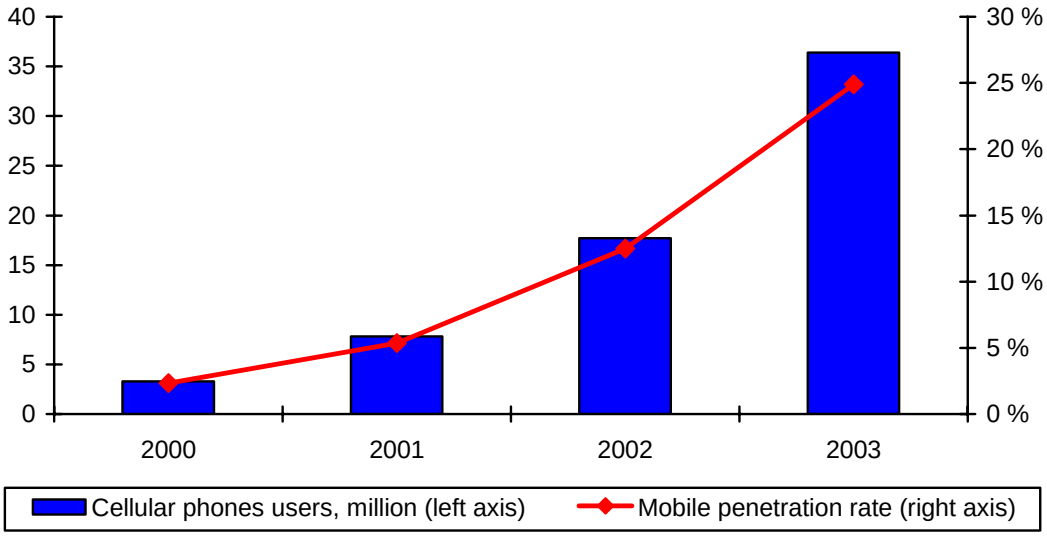
In the nearest future the highest rate of growth is expected in the segments of data transmission and Internet related services. So far, however, the bulk of services in wire communications is traditional telephony.

The level of penetration of personal computers in Russia is still low: less than 7 PCs per 100 people in 2003, and the level of Internet access (number of PCs having connection to the Internet) is approximately four times lower. The total volume of services in the Russian segment of the world wide web in 2003 (about 70% of all Russian Internet traffic is within the country) was about USD 220 million.

## 3.2 Cellular communications

The cellular communications market emerged during the 1990s and has been rapidly growing since due to the high domestic demand and gradual decrease in the cost of the services. By the end of 2003, the number of mobile phone users in Russia reached over 36 million, which is higher than the number of fixed phones installed in the country. Cellular services are at present more accessible to the population than wire telephony.

**Figure 3.12 Number of Users of Cellular Phones and Mobile Penetration Rate in Russia**




Source: CNews, 2004

The market of cellular communications in Russia was started almost from zero with active participation of foreign companies, such as Deutsche Telecom (Germany), TeliaSonera (Sweden-Finland), Telenor (Norway), which are still major shareholders of leading Russian cellular companies – MTS, Megafon, and Vympelcom, respectively – and actively participate in their further development. Foreign investors participate in smaller Russian cellular companies as well. On the whole, this market is one of the most competitive markets in the Russian economy.

Among the services provided by cellular communications operators, telephony (voice communication) is the most popular in Russia. Wireless transmission of data, ISP and other advanced services have just started to find market demand. St. Petersburg and Moscow, the largest domestic markets, are also used as testing grounds for new technological standards and

services in Russia. At the present time, all major cellular communications operators use the GSM standard (second generation, or 2G standard) of cellular communication.

## 3.3 Information technologies

Software developers at present play the key role in the IT segment of the ICT cluster. Their main products are: general-purpose software packages, software packages customized for companies' needs, integrated systems, and providing information security.

**Table 3.5 Sales on Russian Information Technologies Market, USD billion**

| *Products* | *2002* | *2003* |
|---|---|---|
| PC | 1.7 | 1.84 |
| Components | 1.34 | 1.53 |
| Integrated systems | 0.84 | 1.13 |
| General-purpose software | 0.59 | 1 |
| Custom-made software | 0.23 | 0.3 |
| **Total** | **4.7** | **5.8** |

Source: RosBusinessConsulting, 2004

The largest center of information technologies in Russia is Moscow (all companies presented in the table below are located in this city). It is followed by St. Petersburg and Novosibirsk, the second and third largest educational and research centers in the country, respectively. The same cities are the national leaders in the offshore programming services. In some projects for the development of software products intended for export, a high level of labor productivity is being achieved, as compared with the level of global leaders.

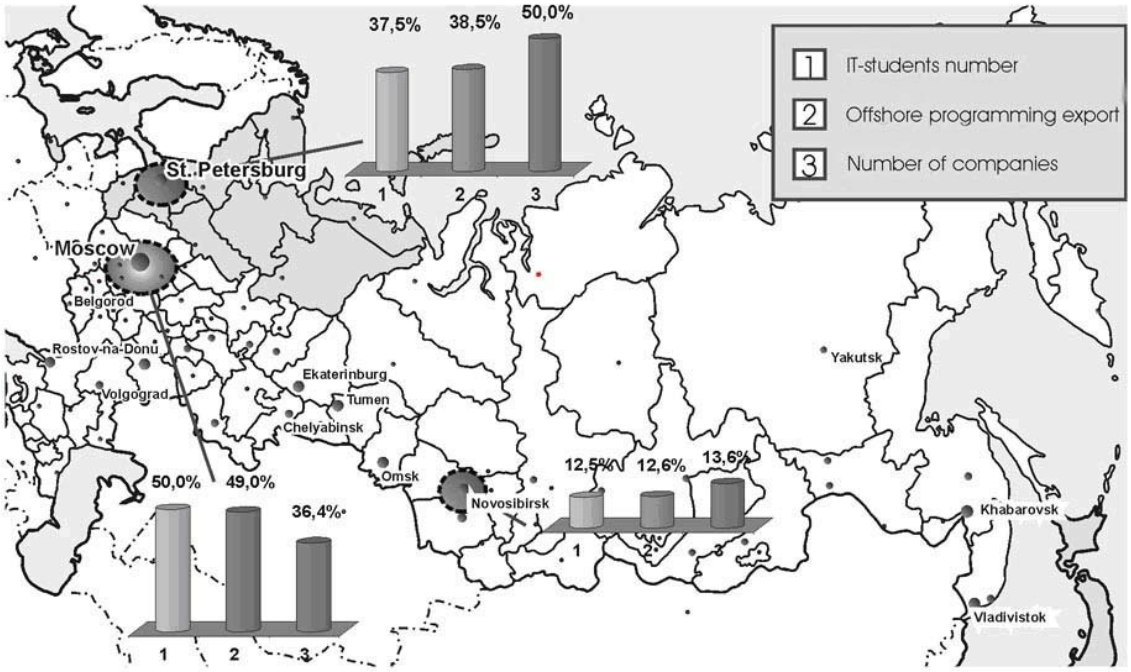
**Table 3.6 Largest Russian Software Developers**

| *Company* | *Sales in 2003, USD million* | *Personnel* | *Productivity, USD thousand** |
|---|---|---|---|
| CBOSS | 80.0 | 1,700 | 47.05 |
| 1C | 65.0 | 424 | 153.31 |
| Cognitive Technologies | 51.5 | 465 | 110.86 |
| Parus | 28.6 | 1,170 | 24.45 |
| Abbyy | 22.7 | 390 | 58.33 |
| Force | 21.1 | 350 | 60.09 |
| Diasoft | 18.3 | 641 | 28.50 |
| Luxoft | 17.0 | n/a | n/a |
| Galaktika | 15.9 | 590 | 27.03 |
| EPAM Systems | 15.0 | n/a | n/a |

Source: CNews, 2004. * Sales per employee

On the whole, the IT market is dominated by small and medium-sized companies which occupy small market niches, so they compete not with one another, but with foreign software developers both in the domestic and international markets. The most successful are small companies with flexible organizational structures founded on the basis of major universities and research institutions and inheriting their major competitive advantages, as well as R&D centers established in Russia by international ICT corporations.

**Figure 3.13 Main Offshore Programming Centers**




Source: Ministry for communications, 2002

One of the chief problems of the Russian market of information technologies remains the extremely wide spread of pirated (unlicensed) use of information products. According to experts' estimates, up to 90% of all software products used in Russia are pirated copies. This situation is conditioned by low income levels of most residents, who cannot afford licensed copies, as well as by insufficiently effective efforts on behalf of the government to combat pirate use of information products. In addition to the ICT cluster, this problem is very grave in media and entertainment industries related to ICT.

## 3.4 Electronic equipment manufacturing

The sales of electronic equipment of domestic manufacture are now substantially lower than the revenues of telecommunications companies. Major manufacturers of advanced electronic equipment and domestic appliances which were established during the Soviet period proved to be uncompetitive under the free market conditions and sharply decreased their output. Small companies established on the basis of large producers and subdivisions of foreign companies located in Russia at present mostly manufacture components and provide assembly services. Their products have substantial demand in the market, but the volumes of production have so far been rather low.

The disorganized and contradictory government policy on regulating customs tariffs, privatization, forming government orders, etc., for a long time was a damper in this area. However, over the recent years the situation has been changing for the better: PC, computer monitor, TV and other electronic equipment assembly plants have been growing rapidly, and this segment is becoming attractive for foreign investors. The launch of the construction of a microelectronics plant in St. Petersburg by the Finnish Elcoteq company can be mentioned as a recent (autumn of 2004) prominent example of foreign investment in Russia' electronics industry.

**Table 3.7 Electronic Equipment Production**

| *Equipment* | *1998* | *1999* | *2000* | *2001* | *2002* |
|---|---|---|---|---|---|
| PC, thousand units | 62.0 | 65.7 | 70.8 | 136.0 | 186.0 |
| Phones, thousand units | 235 | 534 | 783 | 716 | 525 |
| Apparatus for digital and optical fiber transmission, units | 1,228 | 1,222 | 1,066 | 461 | 619 |
| Telephone cables, thousand km | 60.2 | 86.8 | 115.0 | 154.0 | 108.0 |
| TV sets, thousand units | 329 | 281 | 1,116 | 1,024 | 1,980 |

Source: Goskomstat, 2003

Finalizing this chapter, we would like to dwell on some key **challenges that will impact the development of the Russian ICT cluster** in the medium-term future:

***All sectors of the Russian economy require modernization with a wide use of new telecommunication and information technologies***

This created favorable prospects for companies in all ICT segments: wire and cellular communications, IT, manufacture of electronic equipment. Especially good prospects are in the IT segment, since wide computerization of the Russian economy has just started. The vast territory of the country also creates preconditions for rapid development of cellular communications.

***Overall low purchasing power of the population***

Despite the on-going economic growth, the majority of the Russian population is still characterized by low purchasing power compared to Europeans. This to a certain extent hinders the development of the ICT sector: the average European level of mobile communication penetration, number of personal computers, Internet access, etc. will not be reached in the medium term.

***Capitalizing on the international experience***

According to expert estimates, the development of the ICT sector in Russia is lagging behind the world leaders in this sphere by about 3-5 years. Apart from negative aspects, this fact also provides certain advantages: the Russian companies are able to take into consideration the mistakes made in more advanced countries, such as, for example, the overly optimistic estimates of the market capacity for the technological standards of the third-generation mobile communications (3G).

***In order to provide for successful development, it is crucial to make use of the huge educational and research potential that is characteristic of Russia***

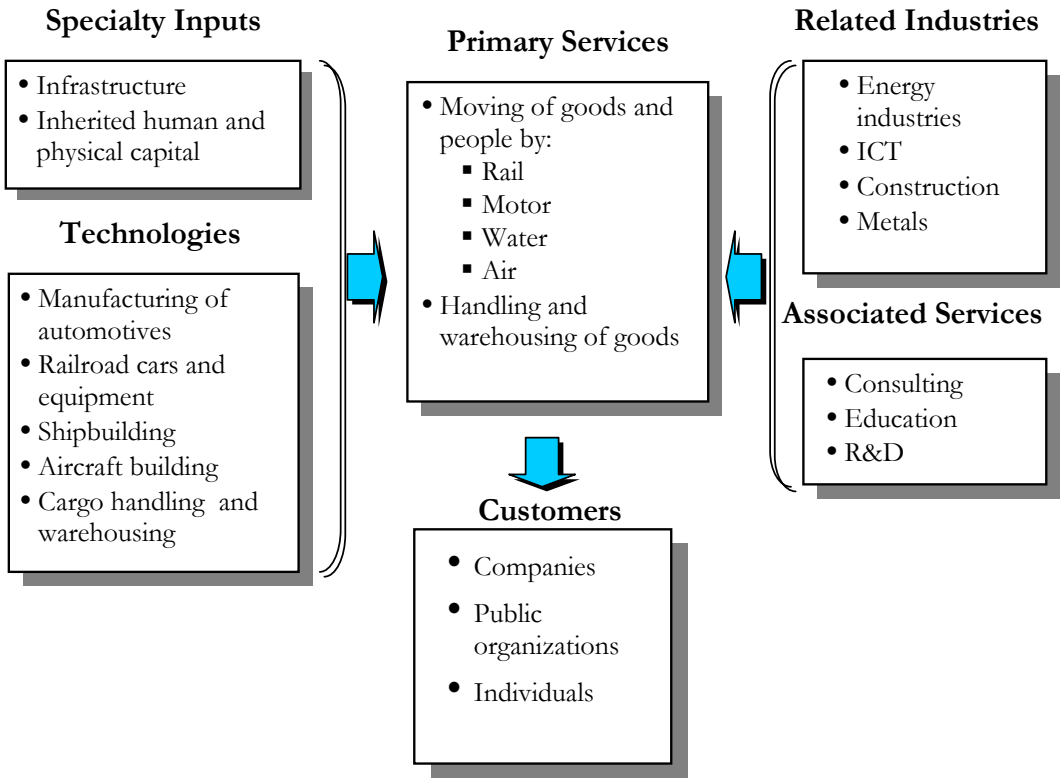
Russia inherited from the Soviet period a huge educational and research potential: universities, science organizations, nuclear industry, space technologies. Of course this potential somewhat deteriorated during the decade of radical economic reforms, but Russia still remains a major force in the international hi-tech and knowledge market.

# 4. LOGISTICS CLUSTER

The Russian logistics cluster should be viewed as a potential cluster. This means that there exists a rather well-developed transport system in Russia which comprises all basic means of transportation and related industries, but their working relationships have just started to develop under the new market conditions and a new competitive environment. All these processes are directly related to the transitional nature of today's Russian economy.

The current Russian statistics accounts for data related to specific types of transportation and the transport sector as a whole along the patterns inherited from the Soviet period. In order to provide for comprehensive analysis of some cluster elements (primarily, related and supporting industries) and the intra-cluster relationships these data is not always sufficient. That is why many estimates are possible only on the qualitative level.

**Figure 4.1 Logistics Cluster Chart**




Other characteristic features of the Russian logistics cluster are also closely related to the peculiarities of the entire Russian economy. First of all, one should consider the fact that Russia is the largest country in the world with the area of 17,075 thousand square kilometers. At the same time, the density of population in Russia is low (8.5 people per square kilometer), and its distribution is very uneven. About 75% of the population is concentrated in the European part of Russia which accounts for only 22% of the country's area.

**Figure 4.2 Area (numerator) and Population (denominator) by Federal District of Russia, % of total**


Source: Goskomstat, 2003

At present, the Russian industry mostly involves extraction and processing of raw materials. The bulk of all resources (oil, natural gas, metal ores, timber, etc.) is located in the Asian part of Russia characterized by severe and cold climate and very low density of population. This creates rather difficult conditions for the development of transport infrastructure in the northern and eastern regions of Russia.

On the contrary, the majority of processing industrial facilities is located in the European part of Russia and in Southern Siberia. That is why the Russian logistics cluster is characterized by very long cargo transportation distances which substantially exceed those typical for the countries of Europe. For many Russian enterprises, transportation costs play an important, often decisive, role in their overall production costs.

The share of transport sector in the Russian economy as a whole is rather high: in 2000-2002 it accounted for about 7.5% of GDP of the country.

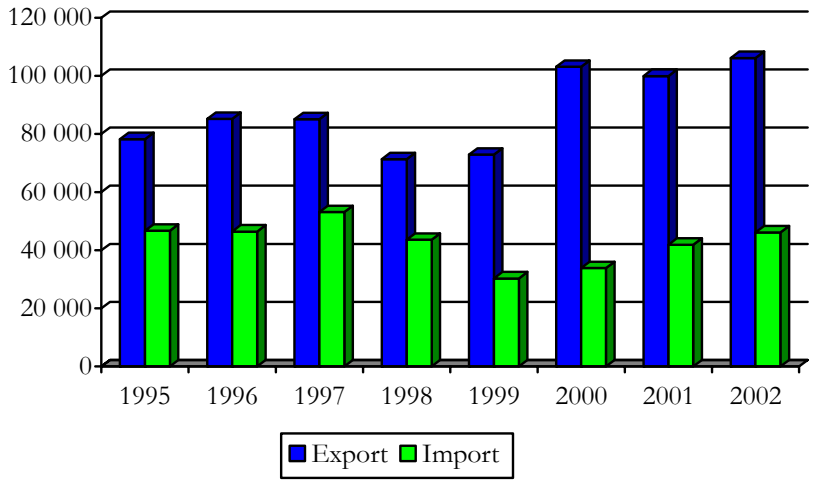
The density of the transport infrastructure in Russia is very much like the population density: in the European part of Russia and in Southern Siberia it is much higher than in the eastern and northern regions of the country.

**Figure 4.3 Transport Infrastructure in Russia**

Over the last few years, the development of the transport sector has been closely related to the growth in the Russian foreign trade turnover. New transportation main lines and cargo terminals are being constructed in order to provide for export trade which is focused on raw materials, including hydrocarbons, primary metals, round wood, etc. (*commodity structure of Russian export and import is given in the Figure 2.3*). The volumes of import trade are so far much lower, and mostly include products with higher value added that require high quality transportation services.

At the same time it should be pointed out that "grey area" operations are extensively made use of in order to lower real prices of imported goods and, therefore, minimise tax payments. This is why actual import volumes, although smaller in money terms than export turnovers, are not as inferior to exports as the official Russian statistics suggest. Moreover, imports in the past few years have been growing faster than exports as a result of rising household incomes and the fact that many companies have formed substantial financial resources for modernization.

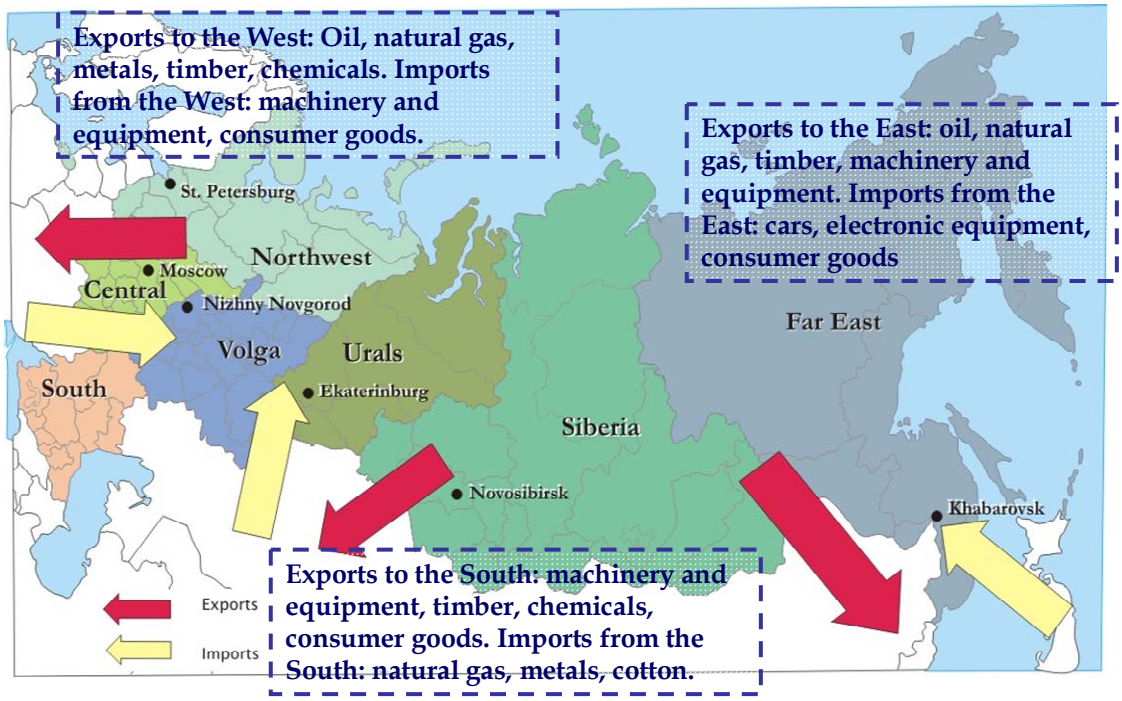
**Figure 4.4 Russian Export and Import, USD million**




Source: Goskomstat, 2003

The geography of the Russian foreign trade, i.e. varying volumes and commodity structure of imports and exports in the three main directions (to the west – to Europe and America, to the east – to the countries of Eastern Asia, to the south – to the countries of Central and Southern Asia and the Middle East), is also reflected in the characteristics of the Russian transport sector development. Thus, the western and, to a less extent, eastern directions are characterized by active development of sea terminals and transportation links to them.

**Figure 4.5 Russian Export and Import Flows**

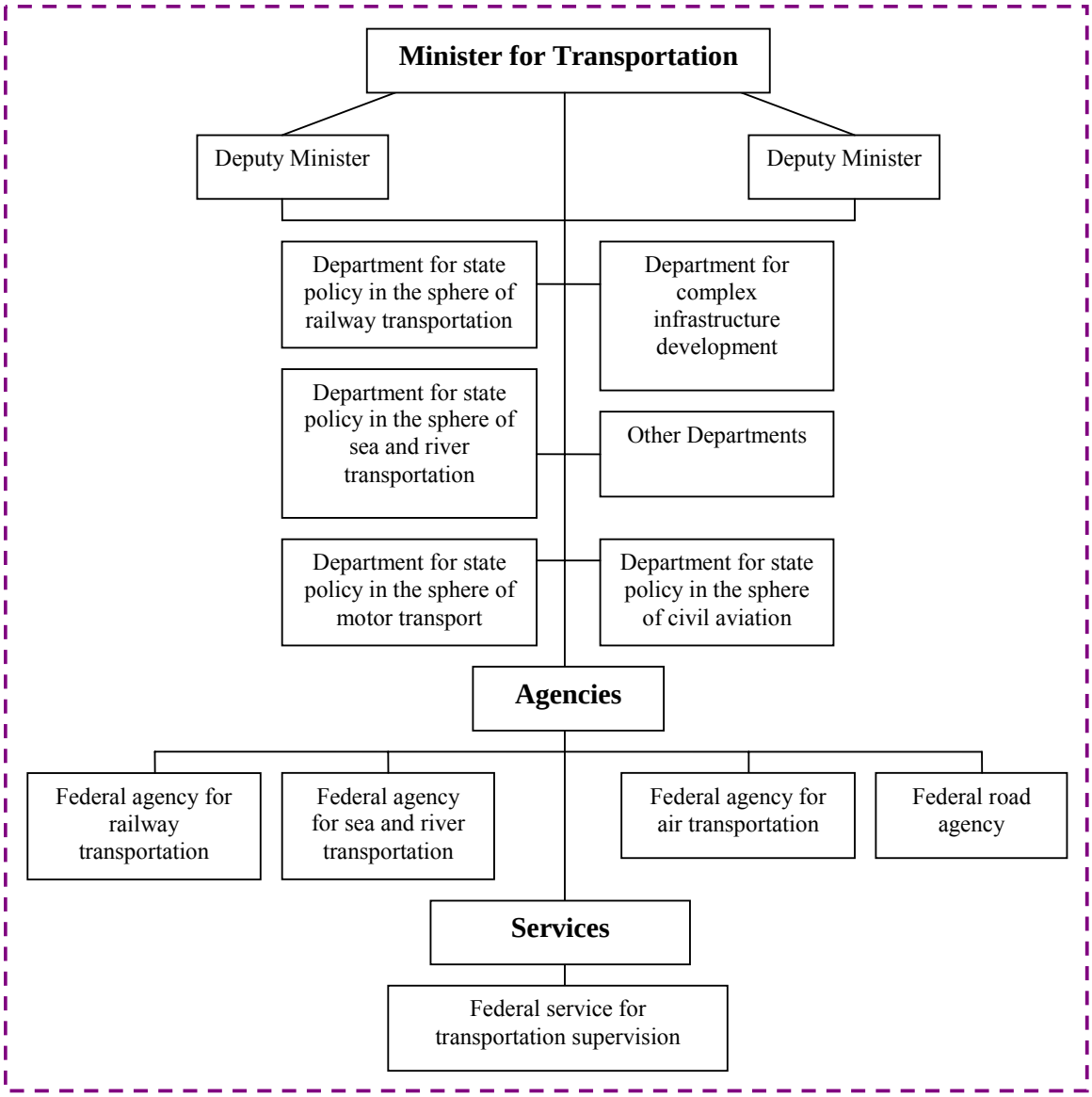



Covering a vast territory of Europe and Asia, Russia possesses a great potential for international transit trade. Presently, this potential is being realized only to a very small extent, but in future, as the Russian economy is more and more integrated into the international transport networks, the role of Russia as a major transit transportation country should grow immensely. Especially favorable are two important transit routes through the Russian territory: from Europe to Asian and Pacific countries (Transsib corridor) and from Europe to Southern and Central Asia (North-South corridor).

**Figure 4.6 Main International Transit Routes via Russia**

The Russian government plays a major role in the development and operation of the transport sector of Russia. It controls (through state-owned companies) all basic transport infrastructure in the country: main railroads and automobile roads, main pipelines, hydro-technical facilities (canals, canal locks, artificial water basins, etc.), and many transport terminals. Besides, the government is a shareholder of a number of large logistics and transportation companies, and also sets the tariffs for railroad and pipeline transportation. The models of state regulation in the transport sector have changed substantially over the last few years due to the changes in the federal government bodies. At present, the division of responsibilities is the following:

**Figure 4.7 Government Regulation Bodies in Logistics Cluster**




Over the 1990-s, the government transport policy was unstable and unclear, state investment in the transport infrastructure was insufficient for its sustainable development. At present, however, the situation is changing for the better. In particular, the Russian government prepared the Transport Strategy of the Russian Federation, which:

- Sets main directions for evolving transportation networks, their main objectives, forms and content of state activities related to developing transportation networks for the period up to the year 2025.
- Establishes a unified set of priorities common for all transportation branches and directions for implementing these priorities for various types of transport based on their specifics.
- Is the basis for decision making in state transportation policies, the development of targeted programs for transportation sector and related sectors of the economy, resolving social, defense and other issues in specific sectors of the economy, regions and the economy as a whole in so far as they are dependent on transportation.
- Is viewed as the basis for evolving a unified vision of the role of transportation today and the outlook for its development by executive and legislative power branches at all levels, businesses, clients of transportation services, all strata of the society.

The process of economic liberalization in various segments of the transport sector is slowly going ahead, and the government influence on economic processes is gradually diminishing. However, the competitive environment is generally weak. State companies dominate the segment of passenger transportation. The fact that the majority of Russians still has low incomes and, consequently, cannot afford private automobiles, makes the provision of most public transportation services a vital function in many parts of Russia. This is why the government strives to maintain low price levels and retains the ownership of passenger transport sector, compensating state companies' losses from budgets of various levels. The practice of so-called 'cross-funding' is generally very common in state transportation companies: unprofitable segments are helped by more successful ones.

The segment of cargo transportation is also a subject to government regulation, although to a much lesser degree. In all types of transport (other than pipeline transport) private transportation companies prevail in numbers. There are also fairly many companies with mixed (private and state) ownership. The state or municipal governments can usually have any holding in this type of companies, even as high as controlling interest.

Transportation companies owned 100% by the government adhere to the Ministry of Transportation of the Russian Federation. They belong to four federal holding companies: Rosavtotrans (motor transport), Rosmorflot (sea transport), Rosrechflot (inland water transport) and Rosaviatsia (air transport). All these types of transport are currently undergoing privatisation. Thus, 87 state-owned transport companies were scheduled to be privatised in 2004 along with 59 government-owned portfolios in shipping companies with mixed ownership.

The situation is different in the rail and pipeline transport sectors. The privatisation of the Russian Railways federal railroad holding company keeps on being postponed, even though the government has made many statements about the need to develop competition in rail transport. As to privatisation of pipelines, there are not even plans for it yet.

Most large industrial enterprises operate their own transport departments in order to guarantee stable supplies of raw materials and sales of end products. This leads to the fact that the weight of goods carried and tonne-kilometers of public transport (road and water) are often substantially lower than in the case of non-public transport. On the other hand, some of these transport departments become large public companies. For example, Severstaltrans, former subdivision of Severstal steel company, became one of the largest multi-modal operators in Russia.

Other non-government transport companies can be divided into two groups:

- Large companies that appeared after privatisation and reorganisation of what was formerly Soviet government-owned firms.
- New companies, i.e. those that emerged in the past fifteen years. Those are usually medium-sized or small companies handling transportation or stowage and stevedoring operations.

The entry of foreign shipping companies to the Russian market encourages tougher competition and the introduction of new technologies in the transportation branch. Today a fairly high number of small- and medium-sized foreign transportation companies operate in Russia.

There are also some large international transportation companies among the foreign players in Russia: Schenker, Danzas, Kuhne&Nagel and others. Their operations cover the entire territory of Russia, but the core volumes of their services fall on the country's European part. These companies have their own car fleets and own and/or rent warehouses near the largest logistical centres (Moscow and St. Petersburg), stevedoring and reloading facilities at ports, as well as railroad carriages. They all operate in multi-mode regime (using different transportation modes), providing a full range of logistical services that include expediting, freight, customs clearing, etc.

**Table 4.1 Goods carried by mode of public transport, mln. Tonnes**

| *Public transport* | *1990* | *1995* | *1998* | *1999* | *2000* | *2001* | *2002* |
|---|---|---|---|---|---|---|---|
| Total transportation | 6858.5 | 3457.6 | 2348.6 | 2427.7 | 2559.8 | 2609.9 | 2612.9 |
| Railway | 2140 | 1028 | 835 | 947 | 1047 | 1058 | 1084 |
| Road | 2941 | 1441 | 593 | 556 | 550 | 561 | 503 |
| Pipelines | 1101 | 783 | 790 | 802 | 829 | 853 | 899 |
| Maritime | 112 | 65 | 36 | 31 | 27 | 24 | 26 |
| Inland waterways | 562 | 140 | 94 | 91 | 106 | 113 | 100 |
| Air | 2.5 | 0.6 | 0.6 | 0.7 | 0.8 | 0.9 | 0.9 |

Source: Goskomstat, 2003

The Russian cargo flows are dominated by railroad and pipeline transportation, since it is these modes of transportation that are mostly used for carrying heavy raw materials to long distances. The comparative importance of sea transport in domestic transportation is still very low, despite the fact that Russia has access to a large number of seas. This is partly due to severe climate whereby most northern seas are not used most of the time due to ice.

**Table 4.2 Tonne-kilometers by mode of public transport, bln.**

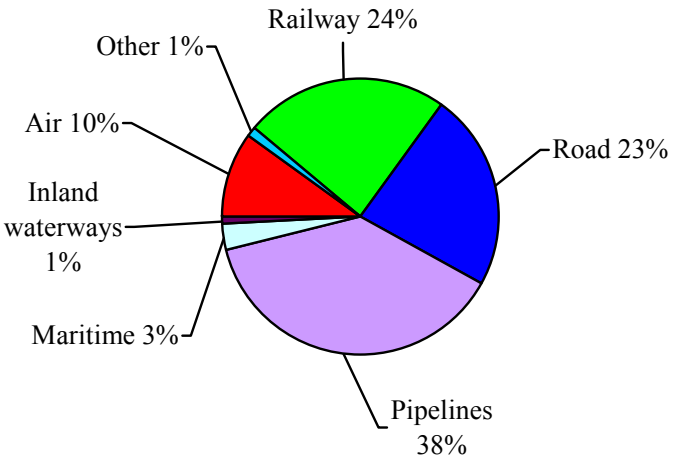
| *Public transport* | *1990* | *1995* | *1998* | *1999* | *2000* | *2001* | *2002* |
|---|---|---|---|---|---|---|---|
| Total transportation | 5890.6 | 3532.6 | 3147 | 3315.3 | 3479.5 | 3591.6 | 3801.7 |
| Railway | 2523 | 1214 | 1020 | 1205 | 1373 | 1434 | 1510 |
| Road | 68 | 31 | 21 | 22 | 23 | 23 | 23 |
| Pipelines | 2575 | 1899 | 1888 | 1904 | 1916 | 1962 | 2100 |
| Maritime | 508 | 297 | 150 | 121 | 100 | 94 | 93 |
| Inland waterways | 214 | 90 | 66 | 61 | 65 | 76 | 73 |
| Air | 2.6 | 1.6 | 2.0 | 2.3 | 2.5 | 2.6 | 2.7 |

Source: Goskomstat, 2003

Cargo flows (tonne-kilometers) serviced by road transport in Russia are very low, and is mostly used for short-distance routes. Even considering the non-public transport, the cargo carrying capacity of the road transport is ten times lower than of the railroad transport, while the leadership of pipelines results from very large volumes of oil and gas transported to Europe from Siberian oil and gas fields.

During the last decade, the main performance indicators of all types of transportation in Russia have declined substantially. Thus, compared to 1990, the cargo turnover of railroads in 2002 has declined by 40%, road transport by 66%, pipelines by 18%, sea transport by 5.5 times, and inland water transport by 2.9 times. All this reflects the general decline of the Russian economy. In the period between 1995 and 2002 only the railroad, pipeline, and air transport partly recovered, while the indicators in the public water and road transport have continued to deteriorate.

**Figure 4.8 Investments in fixed capital by mode of transport in 2002, % of total**




Source: Goskomstat, 2003 – data by large and medium-sized companies

Within the period of 1995-2002, the largest capital investment was addressed to pipeline and railway transportation, as well as to construction and maintenance of automobile roads. In 2002, total investment into fixed assets in logistics and transport sector amounted to USD 8.3 billion in current prices. The main source of investment was the state budget, while private companies that dominate goods carrying, storage and stevedoring services (over 80% of the total number of companies operating in these segments) as of now do not possess extensive financial resources for substantial investment programs.

**Table 4.3 Depreciation of fixed capital at the beginning of 2003, %**

| ***Total transport*** | ***57.0*** |
|---|---|
| Railway | 59.8 |
| Road | 48.7 |
| Pipelines | 44.0 |
| Maritime | 45.3 |
| Inland waterways | 59.2 |
| Air | 55.9 |

Source: Goskomstat, 2003 – data by large and medium-sized companies

Constant lack of investment over the last decade resulted in a large extent of deterioration of fixed assets in the transport industry, which is reflected in its low productivity rate and frequent accidents and breakdowns. The situation in pipelines is slightly better, since, in order to provide for stable export supply of hydrocarbons, the average level of investment was higher.

**Table 4.4 Indices of goods carriage tariffs calculated from December to December, %**

| *Public transport* | *1991* | *1995* | *1998* | *1999* | *2000* | *2001* | *2002* |
|---|---|---|---|---|---|---|---|
| Total transport | 210 | 270 | 117 | 118 | 152 | 139 | 118 |
| Railway | 200 | 240 | 81 | 110 | 169 | 134 | 120 |
| Road | 180 | 270 | 115 | 162 | 137 | 114 | 112 |
| Pipelines | 290 | 360 | 138 | 117 | 137 | 159 | 119 |
| Maritime | 170 | 150 | 326 | 131 | 109 | 110 | 102 |
| Inland waterways | 190 | 190 | 208 | 146 | 119 | 105 | 113 |
| Air | 440 | 210 | 264 | 145 | 113 | 108 | 108 |

Source: Goskomstat, 2003

The growth of transportation tariffs was not stable: in the first half of the 1990s they grew by several times, and then by percentage points. The tariff policy of the government in railway transportation is often directly aimed at support of major exporters: they receive temporary discounts that substantially influence their competitive price policies in the international markets.

The total number of employees in the Russian transport sector in 2002 was 3377.5 thousand people, of which 61% worked in state-owned (most of them are large) companies and 39% in private (most of them are small) companies. The highest incomes were in the pipeline and maritime transport segments, while the lowest were in the automobile and inland water transport.

Among the key current trends in the development of the Russian transport and logistics sector the following should be specified:

- Growth of the Russian industry and the increasing volumes of foreign trade provide for the development of the transport sector.
- The Russian transport sector is gradually integrating into the international networks, and the role of transit cargo flows is growing.
- Emerging flow of foreign investment into the Russian transport sector.
- The government maintains control over the basic transport infrastructure.
- Beginning of implementation of the long-term government program for development of automobile road networks.
- Growing competition in the segments of cargo transportation, storage and stevedoring, i.e. in the segments that are dominated by private companies.
- Growing international competition among Baltic Sea terminals for Russian cargo flows.
- Russian transport companies are trying to pay more attention to the quality of cargo processing operations.
- Rapid development of pipelines and sea terminals for export of crude oil and petrochemical products.

- Continuing low level of transparency of many operations, especially in maritime transport.
- The lengthy recession in water transport has reached the lowest point, and there are some early indications of growth.

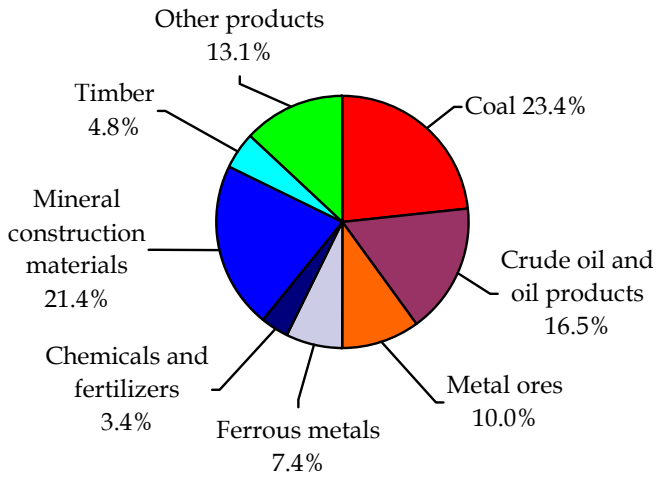
Below we present brief description of various types of transportation, since they have substantial differences. Inter-mode transportation is not well developed in Russia in comparison with Europe. The overwhelming majority of transport companies specialise in some specific types of transportation and attending logistical operation. This in many respects is fashioned by flaws in current legislation: even today there are no common rules for shipping documentation along the entire route, if this route entails transportation by different modes of transport. As a result of this expediting services become seriously complicated, while shipping times grow much longer.

Competition between shippers operating in different transport modes is on the whole not high at this point, but gradually grows, especially between the rail and automotive sectors - about 70% of all rail roads in Russia have motor roads by their side.

## 4.1 Railway transport

The total length of public railroads in Russia is 86 thousand kilometers, of which 49.5% are electrified, and 42.5% have two and more tracks. Besides, there are also 53 thousand kilometers of non-public railroads that are mostly used for short-distance transportation of heavy cargoes (from mines to main railways, etc.): in 2002, the tonne-kilometers of non-public railways were 60 times lower than of public railways, while the weight of the carried cargo was 2.9 times higher. The average density of the railroad network in Russia is 8.1 kilometers per 1,000 square kilometers of territory.

**Figure 4.9 Goods Carried by Public Railway Transport by Commodity in 2002**




Source: Goskomstat, 2003

According to the Transport Strategy of the Russian Federation, a number of new long main railways will be built in the coming 20 years, chiefly in the Asian part of the country,

where most natural resources are concentrated. In addition, plans feature modernisation of some existing railways, in particularly Moscow – St. Petersburg, which is supposed to become a high-speed one (now the average cruising speed on this road is about 200 km/hr). Experience does, however, show that large infrastructure projects, funded primarily from government sources, are implemented rather inefficiently and with huge delays. Moreover, some of these projects carry considerable risks and sometimes remain only on paper. On the other hand, the mechanisms of public-private partnerships needed to implement infrastructure and other projects are in their infancy yet.

The average length of carriage in public railways of one ton of industrial cargo in 2002 was 1,266 kilometers. For some types of commodities this figure is even higher: for ferrous metals it is 1,906 kilometers, for coal 1,584 kilometers, for fertilizers 1,582 kilometers, and for oil and petrochemicals 1,319 kilometers.

The ongoing modernisation of the Russian railroad transport does not proceed fast enough. A consequence of this is frequent shortage of railroad cars for specialised carriages, a rather high percentage of cargo damaged in handling, inability to meet delivery deadlines and other problems. The relative proportion of container transportation in 2002 was only a little over 1%.

Railroad shipping remains one of the least competitive segments of Russia's transportation market today. The government has declared the necessity to demonopolize this sector, but so far only a little has been done in practice. The chief rail operator up to this day is the 100% government-owned Russian Railways company. Russian Railways own and control rail tracks, communications, terminals and other rail infrastructure, as well as a large part of moving stock (locomotives and cars). The company is a federal one with head-quarters in Moscow and branches in every large part of Russia. Today the Russian Railways handle about 80% of all freight carriage in Russia, and 100% of the passenger one. The monopoly position of this company is supported by the fact that it provides access to infrastructure to other shippers of cargo, thus largely influencing their competitive positions.

The policy of regulating rail tariffs takes on board not only the national interest, but also the interest of some largest producers. As a result of lobbying on behalf of regional authorities, exporter-companies are often granted temporary discounts from general tariffs, which form an important element of their price competitiveness in the market. For example, tariff for shipping coal by rail from Kuzbass (South Siberia) are so low, that it is profitable to transport this coal through marine ports in the European part of Russia. In general the current system of tariff regulation is in many ways in contradiction to market principles and hampers not only the development of competitive firms, but also investment (given low returns and no guarantees as far as the future tariffs are concerned).

The number of alternative shippers by rail nevertheless continues to grow, and competition starts to mount in this segment, albeit rather slowly. The share of these alternative (private) shippers also continues to increase from year to year: in 2002 they accounted for 14.1% of all cargo shipped by rail; in 2003 – 16.2%; while in 2004 their share is expected to reach 23% (according to expert forecast). The largest of these alternative rail carriers in Russia is Severstaltrans company. Severstaltrans operates in many Russian regions and was the first private operator to be allowed to form its own locomotive fleet.

## 4.2 Road transport

The total length of hard surface automobile roads in Russia is 755 thousand kilometers, of which 541 thousand kilometers are public roads (46 thousand kilometers of federal and 495

thousand kilometers of regional roads), and 214 thousand kilometers are non-public. The average density of the automobile road network is 44 kilometers per 1,000 square kilometers of territory.

All trunk motor roads in Russia and related infrastructure are owned by the state. Many projects of building private trunk motor roads are discussed, but they have not been implemented yet.

The Russian automobile roads network is very fragmented and dominated by radial network type whereby roads are directed from a city in all directions. The construction of the main highway connecting the Russian Far East with the rest of the country has not yet been completed. Many large cities do not have ring roads. About one third of all agricultural settlements do not have hard surface roads. The majority of hard surface motor ways need to be modernised, since their technical specifications are by far inferior to those of European roads. Yet another major problem is that attending infrastructure, such a service stations, motels, warehouse terminals, etc., is not sufficiently developed.

According to the Transport Strategy of the Russian Federation the State will invest considerable effort in the development of national network of motor roads in the next 20 years. However, just as with the rail, we should keep in mind that these intentions are not always matched by adequate capabilities.

The segment of cargo shipping by car is the most competitive among the Russian transport segments today. This is because in this segment the starting capital level needed to enter the market is the lowest in the branch. Due to this, as well as due to the current difference in taxation of transportation vehicles owned by physical and juridical persons (tax rates are considerably lower for physical persons), small and medium-sized companies, many of which rent vehicles from private individuals, dominate this sector. The average number of lorries per one shipper today is equal five, although in practice this number is higher because, as stated above, a percentage of vehicles are registered as belonging to private individuals. On the whole, the car transportation segment is the least transparent in the entire Russian transportation industry.

The car transport is most important in such branches of economy as trade and agriculture (in final cost of their products outlays in car transportation reach 40% and above), construction (up to 30%) and industry (up to 15%). Small and medium-sized companies in all economy branches usually employ the services of car shipping companies. Most large industrial companies have own transport divisions. The share of such divisions in all cargo transportation by car in Russia is now about 85%.

Russian consumers prefer to use the services of Russian shippers, who are prepared not only to move goods, but also provide additional services: lowering customs payments, replacing customs and consignment documents after crossing a customs point, etc.

On the other hand, foreign companies working in Russia usually prefer services of larger and more reliable transportation companies, chiefly international automobile carriers. Automobile shippers from Lithuania, Poland and Finland and other European countries already play an important role in Russia. Along their side, big Russian car transportation companies, such as Sovavto and Vneshtransavto, are actively engaged in the same market segment and continue to play an important role.

In the opinion of many experts, in the medium-term perspective the Russian market of automobile shipping will undergo consolidation stage and will eventually belong to a handful of key players.

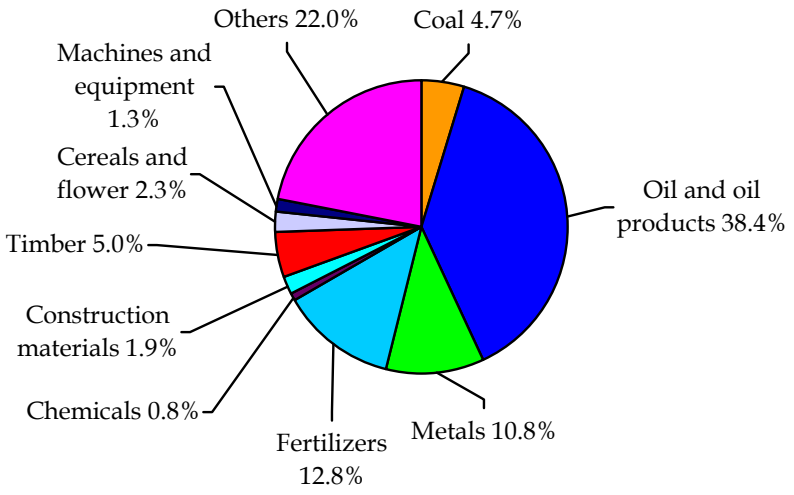
## 4.3 Maritime transport

Russian maritime transport has suffered huge reductions during the past twelve years (five times on the average) – both in the number of vessels and volumes of shipped goods. Maritime shipping companies, privatised in the early 1990ies, frequently preferred selling vessels to maintaining and running them in the climate when shipment returns were low.

Despite a rather high number of private shipping companies, they have the lead only in "river-sea" shipments and in coastwise navigation. Sovkomflot, a state company, holds the absolute lead in long-range maritime shipping. The state also holds controlling interests in most sea ports, as well as harbour infrastructure – quays, maritime canals, wave breakers, rail and automobile access routes and port engineering infrastructure sites. All of these elements are used by stevedoring companies, which usually rent them – both private and those that have a government stake.

The biggest flaw in Russian seaports operations is week coordinating function on behalf of the State: the State does not coordinate tariff policies of various operators within the same port, does not ensure equal access to infrastructure for all participants, does not oversee development of port terminals, which results in creating surplus duplicating capabilities. The role of the state today is practically restricted to maintaining maritime canals in navigational order and in collecting harbour fees (for ships entering a harbour, pilotage, etc.).

**Figure 4.10 Goods Carried by Public Maritime Transport by Commodity in 2002**




Source: Goskomstat, 2003

The chief barrier to further development of Russian marine shipping companies is the use of obsolete vessels and handling technologies. For example, the prevailing vessel type is a bulk carrier with 3-5 thousand tons displacement, while the majority of maritime cargo shipping in the world today is handled by container vessels and "roll on - roll off" ferry vessels. There is also a shortage of ice class vessels and efficient modern handling machinery.

In 2002, most of the cargoes carried by the Russian sea transport (21.5 million tons out of total 26.0 million tons) were international cargoes, including 10.4 million tons of export cargoes, 1.0 million tons of import cargoes and 10.1 million tons of cargoes carried between foreign ports. In the Russian lines 4.5 million tons of cargoes were transported in 2002. Of all cargo transportation 10.4 % were carried by containers. In 2002, non-public (transport de-

partments of enterprises) sea transport transported 37.3 million tons of cargoes, which is 1.4 times more than by public sea transport.

Even though Russia has a long coastal line, only about 600 kilometres are suitable for building seaports. There are 44 civilian commercial seaports in the country today, but most of them are small – with annual turnovers of goods less than 2 million tons. All the largest Russian ports are located along the shores of four seas – the Black Sea, the Baltic Sea, the Sea of Japan and the Barents Sea – which do not freeze in winter or freeze only for a short time. There is also a number of naval ports, which are off limits to civilian vessels.

In 2002, the total throughput of the public seaports was 103.8 million tons (real figures, according to experts, are approximately twice as high), of which 77.8% were export cargoes, 12.2% import cargoes, and 10.0% coasting cargoes.

The Russian government strives to broaden the existing transport and logistic channels used for export operations, and create new ones. This policy is reflected in the construction of new sea terminals and access roads (pipelines, rail and motor roads) to these terminals. Sea terminals are being developed along all three major vectors of Russian foreign trade: western, southern and eastern. In the western direction harbour facilities are being actively expanded along the shores of the Gulf of Finland (in St. Petersburg, Primorsk, Ust'-Luga, Vysotsk, etc.), as well as on the Black Sea coast (Novorossijsk, Tuapse, etc). In the southern direction terminals are being built on the Caspian Sea (Olya, Makhachkala, etc.). Finally, the harbour complex of Nakhodka-Vostochny is being developed on the shore of the Sea of Japan in the Russian Far East.

**Table 4.5 Main Russian Sea Ports**

| *Port* | *Sea* | *Specialization* | *Current Turnover, mln. tonnes* |
|---|---|---|---|
| ***Novorossijsk*** | Black | Crude oil, oil products, metals, fertilizers, containers | More than 50 |
| ***St. Petersburg*** | Baltic | Containers, oil products, forest products, metals, fertilizers | More than 40 |
| ***Primorsk*** | Baltic | Crude oil | Near 30 |
| ***Vostochny*** | Japan | Containers, timber, coal | Near 20 |
| ***Tuapse*** | Black | Crude oil, coal, metals, other dry bulks | Near 20 |
| ***Nakhodka*** | Japan | Crude oil, metals, timber | More than 10 |
| ***Kaliningrad*** | Baltic | Containers, fish, oil and oil products, fertilizers | Near 10 |
| ***Murmansk*** | Barents | Metals, coal, other dry bulks, fish, oil | Near 10 |
| ***Vladivostok*** | Japan | Metals, timber, coal, other dry bulks | More than 5 |
| ***Makhachkala*** | Caspian | Crude oil, dry bulks | Near 5 |

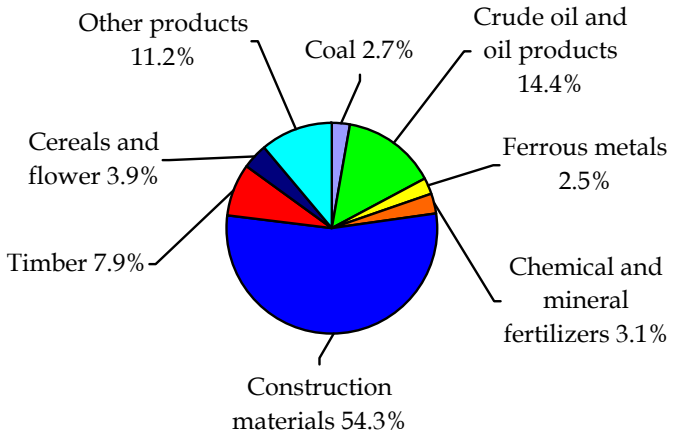
Source: companies' data

The project of an oil port in the vicinity of Murmansk along with the project of radical reconstruction of St. Petersburg's seaport is worth noting among large projects that are being considered at present. Main drawbacks of these and many other similar projects aimed at developing Russian seaports is insufficient study of issues of economic feasibility of new terminals in the long-term perspective, insufficient accounting for competition with seaports in other countries, and on the whole so far insufficiently developed network of providing terrestrial access communications (railroads, motor roads, pipelines).

## 4.4 Inland water transport

The total length of inland waterways in Russia in 2002 was 101.7 thousand kilometers, of which 45.1 thousand kilometers were suitable for transportation purposes (guaranteed by the state agencies). The total number of river vessels in 2002 exceeded 33 thousand, of which one third were barges and other non-self-propelled vessels. 27.3 million tons of cargoes (of 100.2 million tons carried by inland water transport in 2002) were transported in international lines: 21.4 million tons of export cargoes, 0.9 million tons of import cargoes, 4.6 million tons between foreign ports, and 0.4 million tons of transit cargoes. Besides the public inland water transport, transportation services are also provided by departmental transportation - 118.7 million tons of cargoes in 2002.

**Figure 4.11 Goods Carried by Public Inland Water Transport by Commodity in 2002**




Source: Goskomstat, 2003

The infrastructure needed to for inland water transport to function (such as canals, locks, dams, etc.) is owned by the state, while the majority of river vessels belong to private operators. The development of inland water transportation companies in the past 10 – 15 years have been shaped by similar tendencies as those that shaped the development of marine transport. An important distinction here is, we would argue, only the lack of competition with foreign shippers on inland lines: foreign operators simply do not yet have access to this market.

The existing terminals on inland water routes require reconstruction. They can be used only for reloading of different types of bulk cargo, which limits the opportunities for the utilising inland water vessels for transporting goods with high value added, above all in containers.

Russian navigation routes along rivers and canals have very high total length. This has a positive side (possibilities of long-range inexpensive shipping), as well as the negative one: in order to maintain the entire infrastructure in working condition and develop it large investments are required. Moneys received from transport companies are simply not sufficient to meet costs in maintaining the infrastructure in the environment of relatively low cargo flows along inland water routes, while efficient public-private partnership are practically non-existent in this sector today.

## 4.5 Air transport

The total number of civil aircraft in Russia in 2002 was 5.9 thousand (in 1995 – 8 thousand). Of the 0.9 million tons of cargoes transported by air in 2002, 0.4 million tons were transported in international lines. Of 28 million passengers carried by air in 2002, 11.1 million passengers were carried in international lines. Of the 450 Russian airports, 70 were international airports. Over the last decade, the total number of flights decreased sharply because of the high cost of this type of transportation. However, the air transport is very important for the Russian economy: many remote settlements in Siberia and the Far East do not have any other transport connection with the rest of the country.

Airports and airport-related infrastructure are owned by the state. The state also has sizeable holdings in all largest Russian airlines. In addition, the state retains the monopoly in choosing aircraft that can be used domestically.

As a result, the segment of air transport now displays a situation largely resembling the centralised planning system. Excessive government control is accompanied by very scarce opportunities for the development of competitive activities, while the state's coordinating function suffers from very poor effectiveness in decision-making and implementation. In 2005 the government intends to proceed with the privatisation of air transport: among other, to sell its shares portfolio in the largest Russian airline – Aeroflot.

**Table 4.6 Largest Russian airports**

| *Airport* | *Number of passengers (departure) in 2002, thousand* |
|---|---|
| Moscow-Sheremetevo | 5381 |
| Moscow-Domodedovo | 3300 |
| St. Petersburg | 1584 |
| Moscow-Vnukovo | 1506 |
| Novosibirsk | 566 |
| Ekaterinburg | 539 |
| Krasnoyarsk | 505 |
| Sochi | 429 |
| Surgut | 428 |
| Samara | 396 |
| Khabarovsk | 373 |
| Ufa | 342 |

Source: Goskomstat, 2003

Russia's airports and air space are also used by foreign airlines flying international and transit routes. The potential of air transit over the territory of the Russian Federation is very high, especially as far as routes from Europe to China, Japan and Korea are concerned. Yet this potential remains implemented only to a small degree because the infrastructure of transit air freight and passenger transportation of the international standard is not sufficiently developed.

As far as international routes are concerned, international airlines have an advantage over their Russian counterparts: their craft meet the ever-toughening international environmental standards, including the noise pollution ones. The majority of Russian aircraft does not fulfil these standards yet. A large-scale replacement of current aircraft with new generation planes will take place in the near future.

## 4.6 Pipelines

Russia possesses the longest pipeline network in the world. The total length of the pipelines is 216 thousand kilometers, of which 153 thousand kilometers are gas pipelines, 48 thousand kilometers are oil pipelines, and 15 thousand kilometers are pipelines for oil products. The average density of the pipeline network is 12.6 kilometers per 1,000 square kilometers of the territory.

**Table 4.7 Goods transported by pipelines and tonne-kilometers in 2002**

| *goods* | *mln. tonnes* | *tonne-kilometers, bln.* |
|---|---|---|
| natural gas | 513.8 | 1203 |
| oil | 359.8 | 867 |
| oil products | 25.7 | 30 |
| total | 899.3 | 2100 |

Source: Goskomstat, 2003

All trunk pipelines in Russia are managed by state-owned Transneft company. Oil products pipelines are also 100% owned by the state Transnefteprodukt company. Oil companies control only local pipelines – from the deposit to the trunk pipeline. All gas pipelines belong to the state gas monopolist – Gazprom. So tariffs (including export tariffs) for the Russian pipeline transport are entirely controlled by the government.

Retaining full government monopoly over the pipeline sector will hold back its development and facilitate further wear (it is very high on all trunk pipelines as it were, except for newly built ones). Cumbersome government machine is very slow in responding to market changes and changes in available hydrocarbon resources, which will lower the efficiency of this type of transport in the future.

Finalizing this chapter, we would like to dwell on the key **challenges which will influence the development of the Russian logistics cluster** in the medium-term perspective:

***Changes in the international markets and reorientation of cargo flows***

The rapidly growing Asian economies (China, South Korea, India, South-East Asian countries) have become one of the most important centers of business activity. The demand in these markets is continually growing, as well as exports from these countries. The intermediate geographical position of Russia between Europe and Asia creates favorable opportunities for substantial growth of transit cargo flows through the Russian territory. The expansion of the European Union is another important challenge for the country's logistics cluster.

***Growth of the Russian industry***

The on-going reforms of the Russian economy, increasing competition and the overall growth of industry create favorable prospects for the transportation sector. At present, Russia is a major source of raw materials for developed economies, and in the medium term this situation will be in place. Since Russia is now one of the top oil exporting countries in the world, the growth in the world oil prices may substantially boost the development of the Russian economy as a whole and of the logistics cluster in particular.

***State regulation and participation in infrastructural development projects***

Due to the vastness of the Russian territory, the state regulation of the transport sector requires specific approaches. Development of the transport infrastructure is practically impossible without large public investment, especially in the scarcely populated, but rich in natural resources northern and eastern parts of the country. The future development of the transport sector and its transformation into a working cluster is closely related to the degree and mechanisms of state regulation. In order to attract investment, the government should develop transparent and unified rules for both foreign and domestic businesses.

***Need for substantial increase in the quality of services***

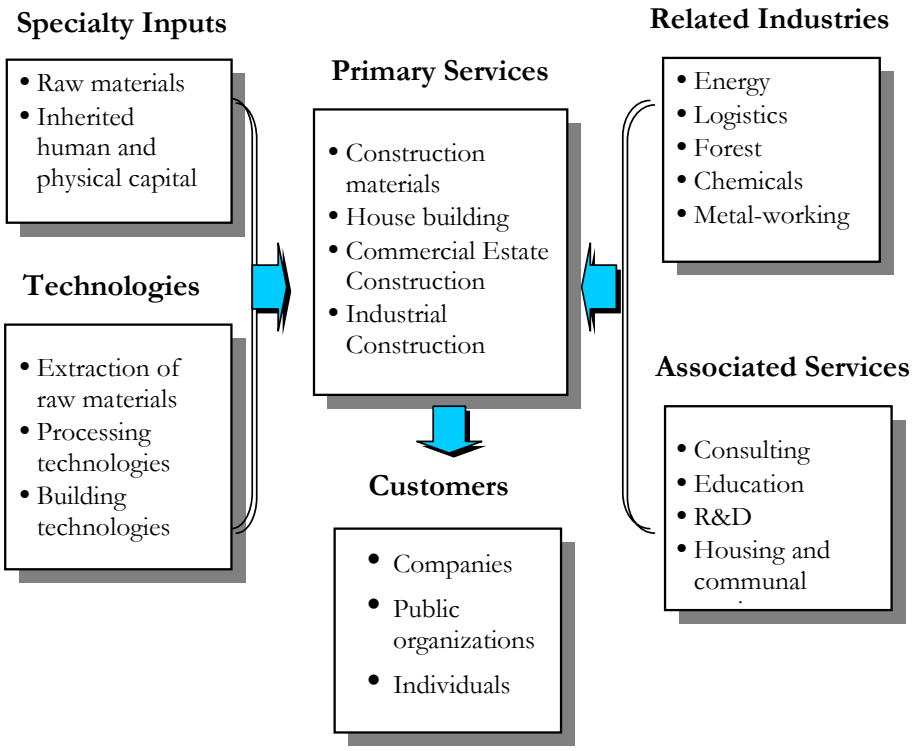
The internationalization of the Russian economy requires a substantial increase in the quality of logistics services. This also includes higher transparency of all types of activities, implementation of information technologies, development of transport terminals, inter-modal transportation, container transportation, etc.

# 5. CONSTRUCTION CLUSTER

The Russian construction cluster consists of two main sectors – construction branch and the branch involved with production of construction materials. Each of these two sectors subdivides into a number of segments. The construction sector is divided into residential estate, commercial estate, industrial estate and infrastructure building. The construction materials sector consists of over 20 branches, each specializing in specific types of products. Russian statistics views the building industry and production of construction materials as two discrete entities. Construction is viewed as one of the basic economy sectors (along with industry, agriculture, transport, etc.), while construction materials production is designated as one of branches of industry.

Construction branch shapes the development of the entire construction cluster. Fluctuations in the construction market directly impact production of construction materials. Virtually all segments of the construction cluster are rapidly growing today. This is due to steady growth of the Russian economy as a whole in the recent years, which is followed by a greater investment in industry and other sectors of the economy, mounting business activity in big cities and upward earnings of communities, which is reflected in growing demand for real estate.

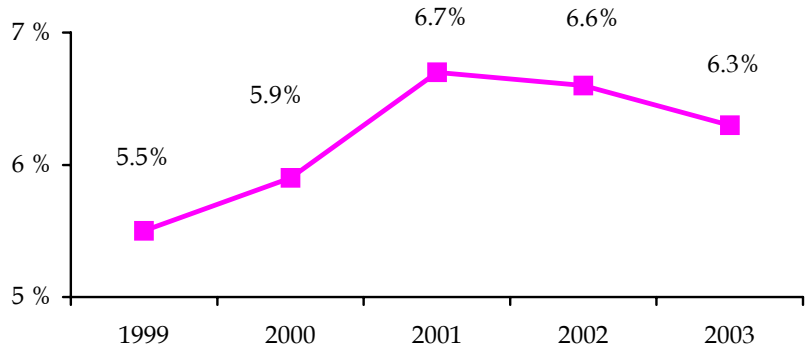
**Figure 5.1 Construction Cluster Chart**




In the past years the share of construction branch in Russian GDP was steadily in excess of 6%. This figure for the entire construction cluster (including the input from construction materials sector) is close to 8%. Not only building volumes have been raising, but also the production of construction materials. Particularly high growth rates were characteristic of residential house construction. Real estate prices have been going up even faster than con-

struction volumes, since residential housing remains in short supply. This situation is a consequence of the crisis that struck the construction branch in the 1990-ies, when severe economic recession has resulted in manifold decrease of house building in the country.

**Figure 5.2 Share of Construction Branch in Russian GDP**



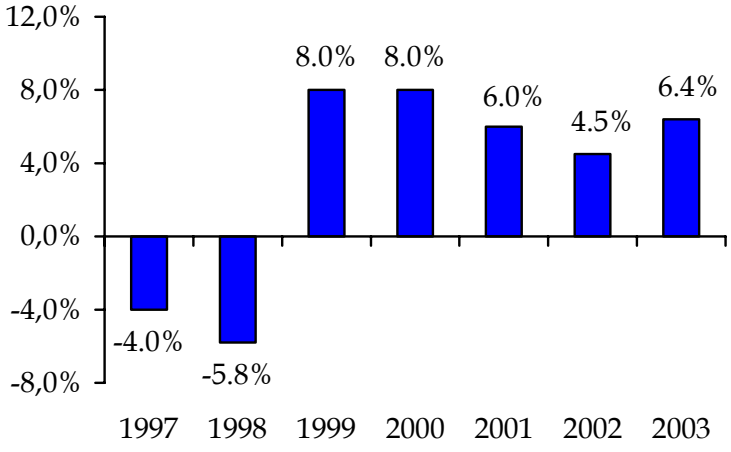

Source: Goskomstat, 2004

Commercial estate construction was another segment of the construction branch that experienced stable growth in the past years. As to industrial and infrastructure building, they have been marked by considerable fluctuation of their development rates.

Two turning points are clearly discernible in the development of construction materials branch. The first one occurred in early 1990-ies, when import of building materials sharply rose in volume. This has in turn leaded to a slump in the domestic production of construction materials, which lost the market to imported goods.

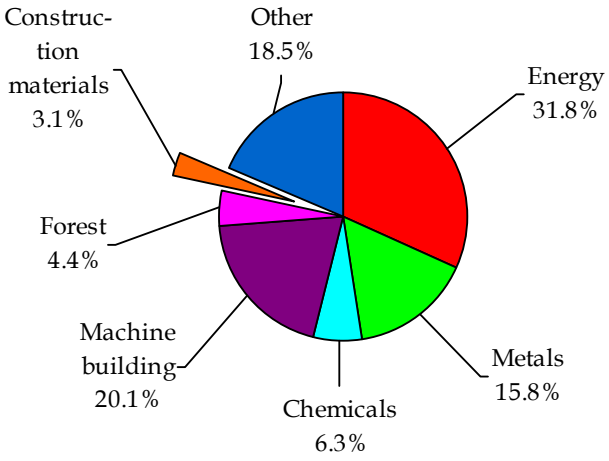
The second turning point was in relation to the financial crisis of 1998, which made imports considerably more expensive. This provided a powerful stimulus to domestic producers, who rushed out to fill the vacant niche. In the recent years the output of construction materials have been growing at the annual rate of 4-6%, but production volumes are still much lower compared to the level of 1990.

**Figure 5.3 Construction Materials Industry Growth, % of the previous year**




Source: Goskomstat, 2004

**Figure 5.4 Construction Materials Industry among Russian Industries in 2002, %**




Source: Goskomstat, 2004

Today the Russian leaders in terms of construction volume are the most successful regions, among which are Moscow, Moscow Region, St. Petersburg, Khanty-Mansy Autonomous District (Russia's leading oil producer), Yamal-Nenets Autonomous District (Russia's leading natural gas producer), Krasnodar Region, Tatarstan Republic, and some others. Given that present economic growth rates persist, we can expect sizeable construction growth in other Russian regions as well, first of all in big cities and in main industrial areas.

Construction materials branch is closely linked with main construction centres, i.e. big cities. They are located in the European part of Russia and in the South of Russia's Asian part.

**Figure 5.5 Biggest Cities in Russia**


Source: Goskomstat, 2004

The overwhelming majority of companies in the construction cluster were privatised in the 1990-ies, or initially emerged in the last 15 years as private companies. The state mostly plays the role of a regulating authority. The main regulating body is the Federal Agency on Construction, Housing and Communal Services, which is under the authority of the Ministry of Industry and Energy (*scheme is given in the Figure 2.5*). This Agency's chief role is to implement government policies pertaining to construction, city planning, construction materials branch and housing and communal services. The branch concerned with the extraction of construction materials found in nature (sand, building stone, etc.) stands apart from others and falls under the authority of the Ministry of Natural Resources.

Even though the number of players involved in all segments of the construction cluster is relatively high, it is premature to claim that the competitive environment is well developed here. The markets in many segments (for example residential housing construction, infrastructure building, brick industry, mining branch, etc.) have been virtually divided between a handful of large local companies that dictate terms to other players. In addition, activities of most Russian construction companies and firms are extremely far from being transparent. Various schemes and arrangements, allowing to lower tax payments, are commonplace. Yet the situation does gradually change towards higher transparency, albeit insufficiently fast, and the development of real competition in most segments.

A number of tendencies are clearly discernible when we look at the current stage of development of the Russian construction cluster, which, most probably, will fashion the development in respective areas in the near future:

- Overall growth of the construction cluster due to national economic growth.
- Low transparency and rather high degree of monopolization.
- Diversification of construction branch and development of new segments of the market of construction materials.
- Rapid growth in the segment of elite housing and commercial estate construction.
- Expansion of activities of foreign construction companies, including by expansion into the market of residential house construction.
- Demand for houses is in excess of supply.
- Industrial construction experiences a revival after a long slump.
- Growth of infrastructure construction (pipelines, motorways, etc.) – fuelled primarily by state investment.
- High risks associated with long-term construction projects due to unstable macroeconomic development.
- Foreign producers of construction materials expand their presence in the Russian market by acquiring existing factories and building new ones.
- Technological lag of Russian producers of construction materials facilitates high share of imports of high-quality construction materials.

In the following we will look in more detail at key characteristics of each of the two main construction cluster sectors: construction materials industry and building industry.

## 5.1 Construction Materials Industry

The average share of Russian-made products in today's construction materials market is 92% and imported goods 8%. Imported goods, however, have much higher weight in the segment of high-quality products, reaching 20% and more. As Russian producers of construction materials still lag behind in technology, they are not able to produce competitive construction materials with high added value.

Russia exports construction materials primarily to C.I.S. countries. In the past years exports of such goods as cement, asbestos ware, and construction steel work increased noticeably. Export's share in the total volume of manufactured construction goods is 4-6%. Imports from C.I.S. countries into Russia are primarily raw materials for construction goods. Upmarket high-quality goods dominate Russian imports from Western nations, as they have no analogues in Russia.

**Table 5.1 Russian Construction Materials Export/Import, USD million**

| *#HS (1996)* | *Article* | *2000* | | *2001* | | *2002* | | *2003* | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Export* | *Import* | *Export* | *Import* | *Export* | *Import* | *Export* | *Import* |
| 3208 | Polymer based paints, varnishes in non-aqueous medium | 25.832 | 109.762 | 25.791 | 122.021 | 33.665 | 134.243 | 39.341 | 163.608 |
| 3214 | Putty, mastics, painters fillers etc. (non-refractory) | 4.951 | 50.815 | 4.637 | 70.299 | 4.654 | 100.949 | 5.545 | 133.03 |
| 4814 | Wallpaper and similar wall coverings etc., of paper | 3.968 | 51.575 | 2.688 | 77.661 | 2.503 | 83.713 | 3.963 | 102.401 |
| 3918 | Plastic floor, wall or ceiling covering, roll or tiles | 3.583 | 12.982 | 3.437 | 36.403 | 5.84 | 46.323 | 8.399 | 74.729 |
| 2523 | Cement (portland, aluminous, slag or hydraulic) | 42.448 | 4.466 | 49.482 | 3.478 | 46.173 | 9.972 | 65.894 | 10.576 |
| 6902 | Refractory brick, block, tile etc. - not siliceous-earths | 33.411 | 35.471 | 31.712 | 30.294 | 27.127 | 36.312 | 36.706 | 33.214 |
| 7610 | Aluminium structures, parts new, for construction | 228.05 | 10.375 | 65.571 | 12.896 | 112.223 | 16.201 | 48.505 | 19.536 |
| 3209 | Polymer based paints, varnishes in aqueous medium | 2.522 | 18.730 | 2.374 | 29.962 | 3.060 | 43.014 | 7.037 | 49.236 |
| 6910 | Ceramic bathroom, kitchen and other sanitary fixtures | 3.066 | 17.385 | 4.553 | 23.959 | 5.547 | 32.211 | 6.733 | 42.946 |
| 2517 | Pebbles, gravels, aggregates and macadam | 1.365 | 19.995 | 0.857 | 27.252 | 0.79 | 36.081 | 1.671 | 41.699 |
| 730830 | Doors, windows, frames of iron or steel | 0.212 | 7.495 | 0.359 | 10.76 | 2.877 | 16.16 | 13.323 | 20.031 |
| 6811 | Articles of asbestos-cement & cellulose fibre cement | 4.545 | 3.12 | 5.696 | 2.139 | 11.474 | 2.182 | 20.808 | 6.474 |
| 441820 | Doors, frames and thresholds, of wood | 4.24 | 11.334 | 4.838 | 15.226 | 6.119 | 18.965 | 8.014 | 18.159 |
| 6810 | Articles of cement, concrete or artificial stone | 6.618 | 12.962 | 5.813 | 12.213 | 3.902 | 10.906 | 6.928 | 18.742 |

Source: UN statistics, COMTRADE, 2004

There are about 10 thousand big and medium-size firms producing construction materials in Russia today. According to Russian statistics, the construction materials industry is comprised of the following main branches:

- Mining industry – extraction of construction materials found in nature (sand, clay, building stone, etc.);
- Cement industry;
- Asbestos industry;
- Asbestos-cement industry;
- Production of insulation materials;
- Production of roofing and waterproofing materials;
- Glass industry;
- Production of wall coverings;

- Production of ceramic tiles and sanitary ceramic fixtures;
- Concrete and reinforced concrete production:
- Production of blocks for frame-and-panel construction.

A large number of other industries manufacturing construction materials is not captured in this list, such as: production of construction materials and goods from timber (door and window frames, etc.), wall paper, metalwork, varnish-and-paint products, household sanitary fixtures, etc. These are accounted for as belonging to other industrial branches: mechanical wood-processing, pulp and paper industry, metal-working, chemical industry, etc. In other words, no statistical data is available for all branches manufacturing construction materials together, which makes it difficult to analyze the construction materials branch as a whole.

In 1990-ies foreign producers of building materials entered the Russian market. They either acquired existing productions facilities or built new ones. Since then the weight of foreign manufacturers has been gradually growing, while many production sites belonging to them have expanded. Factories that belong to large foreign players (such as Knauf, Akzo Nobel, Tikkurila and others) normally use technologies that are novel to the Russian market, producing new product types or conventional products of higher quality.

We will now look at some characteristics of a few specific branches of the construction materials industry:

**Table 5.2 Production of Some Types of Construction Materials and Wares in Russia in 2003**

| ***Products*** | ***Units*** | ***Production in 2003*** | ***2003 to 2002 in %*** |
|---|---|---|---|
| Cement | Thousands of tons | 40,986.8 | 108.7 |
| Asbestos cement sheet (slate) | Million pieces of notional tiles | 1,934.5 | 102.1 |
| Construction glass | Thousands of $m^2$ | 35,090.5 | 91.5 |
| Thermal-polish plate glass | Thousands of $m^2$ | 65,453.3 | 103.1 |
| Linoleum | Thousands of $m^2$ | 85,885.9 | 118.5 |
| Soft roofing materials | Thousands of $m^2$ | 420,999.5 | 99.5 |
| Sanitary ceramics | Thousands of pieces | 6,948.4 | 108.6 |
| Stoneware tile for indoor wall facing | Thousands of $m^2$ | 48,450.8 | 122.7 |
| Stoneware tile for floors | Thousands of $m^2$ | 26,765.7 | 137.2 |
| Bath tubs | Thousands of pieces | 974.7 | 116.2 |
| Radiators and convector heaters | Thousand kilowatts (capacity) | 4,003.4 | 107.9 |
| Washroom basins and kitchen sinks | Thousands of pieces | 786.9 | 98.2 |
| Mineral wools and goods from mineral wool | Thousands of $m^3$ | 8,992.6 | 121.2 |
| Walling materials | Millions of notional bricks | 13,646.0 | 97.8 |
| - including construction bricks | Millions of notional bricks | 10,739.6 | 97.5 |
| Precast concrete | Thousands of $m^3$ | 20,775.1 | 103.6 |
| - including blocks for frame-and-panel construction | Thousands of $m^2$ | 5,908.4 | 88.6 |
| Construction materials found in nature | Thousands of $m^3$ | 185,328.4 | 96.6 |
| - including road metal (pebbles) and gravel | Thousands of $m^3$ | 114,560.0 | 103.0 |

Source: Federal Agency on Construction, Housing and Communal Services (Gosstroy), 2004

### Mining Industry

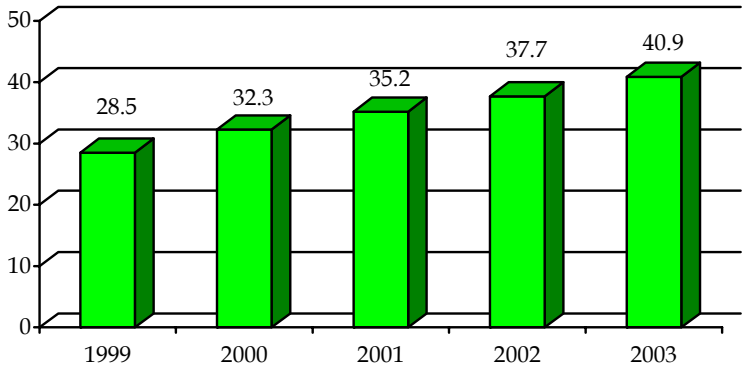
Over five thousand enterprises belong to the branch dealing with extraction of construction materials found in nature. All major types of raw materials for construction are mined in Russia, although there is a shortage of some types of construction materials, which is filled with imports. Imported materials – primarily from C.I.S. countries – include road metal (pebbles), glass-melting sand, refractory fire-clays, kaolin, benthonic clays, and gypsum.

The volumes of raw materials for construction materials production have decreased on the average 2-3 times against the 1990 level for all main raw material types. The structure of the branch has also changed: many new small-sized companies emerged, while the weight of large-size enterprises has concurrently dropped due to depleted reserves and shrinkage of production in low profitability climate. Setting up new large production requires large investment, while the absence of clear long-term land leasing rules has so far kept potential investors away from this market.

### Cement Industry

Russia's cement industry consists of 50 enterprises today. Cement production shrank from 84.5 million tons to 26.0 million tons between 1990 and 1998, marking a decrease of 3.2 times. Starting from 1999 the industry shows steady growth, with cement output reaching 40.9 million tons in 2003.

**Figure 5.4 Production of Cement, mln. of tons**




Source: Goskomstat, 2004

Cement industry remains one of the "dirtiest" among construction materials branches –it is responsible for about 30% of all polluting emissions in this sector.

### Asbestos and Asbestos-cement Industry

Through the past 5 years asbestos production in Russia has increased 30%, while the production of asbestos ware increased 1.5 times. Today 45% of all asbestos extracted in Russia is used to meet the domestic demand (with annual asbestos consumption at 300 thousand tons), and 55% is exported.

The main asbestos (asbestos-and-cement) products are slate (roofing material) and pipes. Slate accounts for 55% of all roofing materials used in Russian construction, including up to 80% in low-riser and farm construction, since slate is 4-6 times cheaper than clay tile, metal, polymeric and other coverings, and can be used in all climate zones.

22 factories in Russia produce asbestos ware today. Five largest asbestos factories output 58% of all slate and 95% of asbestos pipes. On the average they utilise 70% of their production capacity.

### Insulation Materials Production

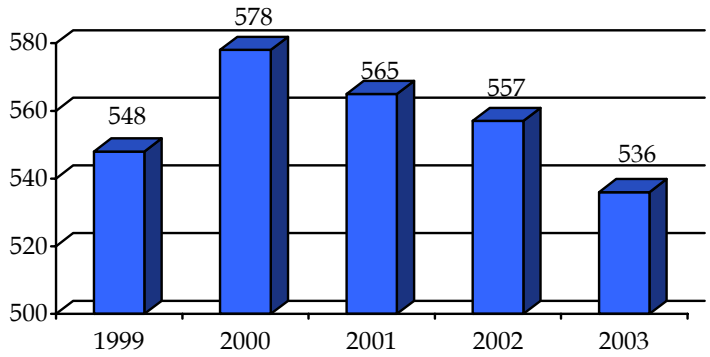
About 9.0 million cubic meters of insulation materials are currently produced every year in Russia, of which about 0.7 million cubic meters is exported. Insufficiently high quality and limited range of Russian insulation ware are responsible for large imports of goods in this group.

The main type of insulation materials produced in Russia is mineral wool goods, the share of which in total production is over 65%. Glass wool goods account for about 8% of all insulation goods, foam plastics for 20% and porous concrete for 3%.

### Varnish-and-paint Production

In the recent years the production of varnish and paint in Russia has been declining by 8-10% a year. This negative dynamics is conditioned by competition from higher quality and more diverse imported goods. Imported goods capture about 35-40% of the Russian market of varnish and paint goods.

**Figure 5.5 Production of Paints, ths. of tons**




Source: Goskomstat, 2004

About 100 factories operate in the Russian varnish-and-paint industry. Their aggregate output can be as high as over 2.5 million tons of varnish-and-paint goods a year. Yet today production sites on the average utilise less than 25% of their production capacity. Over 60% of all goods are produced by 12 largest enterprises. The top-five factories are Empils (16.2% of total production – based in Rostov-na-Donu), Teks (12.7% - St. Petersburg), Cherkesskoe Khimicheskoe Proizvodstvennoe Obyedinenie [Cherkessk Chemical Production Plant] (8% - Cherkessk), Lakokraska (7.3% - Yaroslavl), Russkie Kraski [Russian Paints] (7.2% - Yaroslavl).

Greatest volumes of imported goods currently come from Finland (about 35% of all varnish-and-paint imports into Russia), Sweden (18%) and Germany (16%). In addition, varnish-and-paint branch is lucrative for foreign investors in Russia. Thus, Finnish Tikkurila has opened its own factories on the Russian territory (St. Petersburg and Moscow Region), just as Dutch Akzo Nobel (Moscow Region) and German Caparol (Tver Region).

### Glass Industry

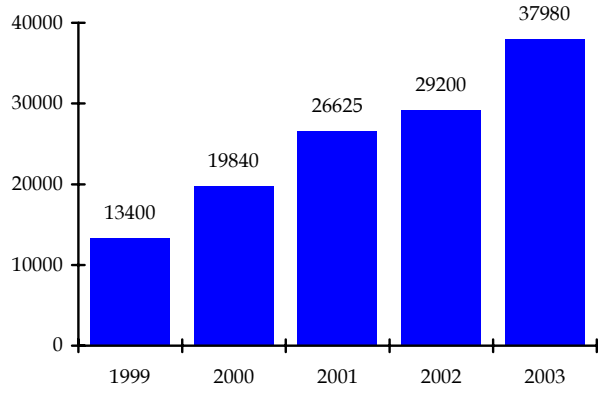
Russia produces about 120 million square meters of glass plate today; over 60% is consumed by the Russian construction cluster. About 10-12% of all produced glass is exported, while imports fill not more than 2% of the Russian glass market.

In 2002 some 13 glass factories operated in Russia. Of them 4 factories used float technology, most widely used in the world today (thermal polish glass), accounting for 74% of all glass production in Russia, and 9 factories used old technologies. According to experts' estimates the market for high-grade glass plate in Russia is far from reaching saturation point.

## 5.2 Building Industry

As of 2002, about 113 thousand construction firms operated in Russia, of which 95% were small businesses with up to 100 staff members. Private sector firms delivered 87.5% of all building contracts in 2002, with state companies handling 9.3% of all contractor agreements and foreign building firms 3.2% of the total contractor work.

**Figure 5.6 Completed contractor agreements in Russian construction, USD million**




Source: Goskomstat, 2004

Despite the high number of companies it is premature to assume developed competition in this market. Each big city's market is virtually monopolised by a handful of companies, which enter into private agreements on spheres of influence and pricing. On the whole, rather low transparency and the fact that tenders are often distributed on the strength of personal contacts between building firm managers and officials, is typical of Russia's building sector.

In addition, largest Russian industrial companies (especially in oil-and-gas sector) typically own their own building divisions or affiliated building companies, which fill orders primarily from their parent companies – in other words, essentially operate outside the competitive environment. The number of such players in the construction business is, however, gradually declining due to outsourcing policies adopted by many industrial leaders in Russia.

All biggest Russian construction firms active in residential and commercial estate segments of the market are located in Moscow. Many of them are holding companies, comprised not only of construction firms themselves, but also of companies producing construction materials.

The largest construction firm in Russia in terms of sales today is Stroytransgaz (daughter company of Gazprom), which builds pipelines. In addition to Stroytransgaz three other top-10

players are active in the infrastructure construction branch: Mosinzhstroy, Transstroy (both build roads, bridges and other transport communications), Moscow Metrostroy (metro builder) and Severtruboprovodstroy (pipelines). Four other of the top-10 companies – DSK-1, MSM-5, Glavmosstroy, and Inteko – operate in residential and commercial building segments, and only one – Mospromstroy – works in industrial construction.

**Table 5.3 Top 10 Construction Companies in Russia in 2003**

| *Company* | *Region* | *Sales in 2003, USD mln.* | *Growth rate, % compared to 2002* |
|---|---|---|---|
| Stroytransgaz | Many regions | 1327.4 | -7.7 |
| DSK-1 | Moscow | 549.1 | 64.9 |
| MSM-5 | Moscow | 490.8 | 56.5 |
| Mosinzhstroy | Moscow | 452.0 | -7.6 |
| Transstroy Corporation | Many regions | 440.2 | -31.3 |
| Mospromstroy | Moscow | 359.6 | 25.0 |
| Glavmosstroy | Moscow | 340.4 | 136.3 |
| Inteko | Many regions | 304.9 | 82.0 |
| Moscow Metrostroy | Moscow | 249.2 | 21.1 |
| Severtruboprovodstroy | Tyumen | 201.8 | 71.9 |

Source: Expert RA, 2004

Foreign construction firms started their activities in Russia from building specific sites (primarily commercial and industry sites) for various foreign firms operating in Russia. As time past by some of these building firms stayed in Russia and expanded their niche by serving new foreign and Russian customers, and by entering the market of residential housing. The main competitive strengths of foreign construction companies are higher quality of delivered sites and on-time delivery.

In St. Petersburg Finnish players stand out among the foreign construction firms: Skanska, YIT, as well as some others. In Moscow the number of foreign construction firms is exponentially higher. This can be attributed to the larger volume of the construction market in Moscow (with annual turnover of the market for new housing being, according to experts' estimate, about USD 7.5 billion), as well as to the densest concentration of foreign companies in Russia. Firms from Germany, Turkey and former Yugoslavia lead among foreign construction firms in Moscow.

We will now look in more details at main segments of the construction sector:

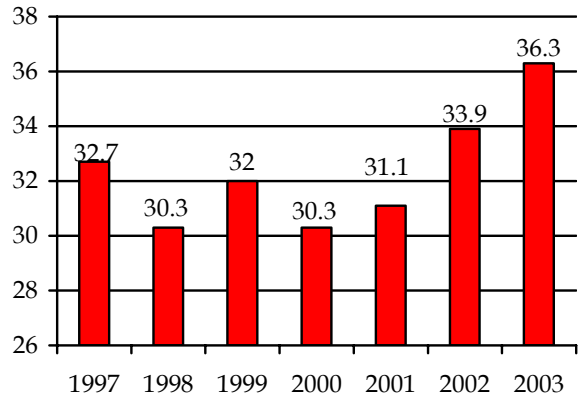
### Residential Estate Construction

As we noted above, positive dynamics for residential housing sector is driven by high price growth rates and persistent shortage of housing. Thus in the past five years prices for new housing have gone up 2–2.5 times on the average in big cities, while construction volumes increased by no more than 30%. The leading markets for residential housing (with over 1 million square meters delivered annually) in Russia are Moscow (4.3 million squire meters in 2002), Moscow Region (3.4 square meters), Krasnodar Region (1.6 million square meters), Tatarstan Republic (1.5 million square meters), Bashkortostan Republic (1.4 million square meters), and St. Petersburg (1.2 million square meters). In other regions residential construction volumes are lower.

Bank loans remain the chief source of funding drawn upon to build residential houses, as well as buyers' money, which they prepay (usually at an early stage of house construction). High

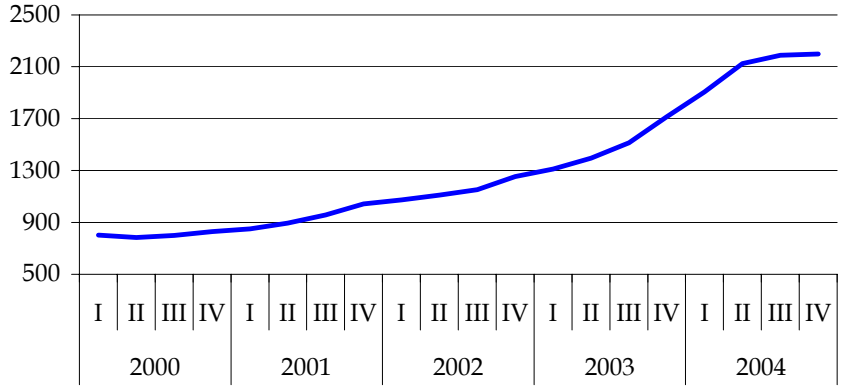
risks arising from instable and underdeveloped nature of Russian banking system, as well as from the fact that successful delivery depends on whether the builder manages to secure buyers' early payments sometimes result in houses remaining unfinished. Many large building contractors in Moscow and St. Petersburg have started to issue bonds in order to secure additional funding for construction. These bonds have, however, so far been of little interest to potential investors, since construction business is still seen as a notoriously high-risk venture.

**Figure 5.7 House Construction in Russia, mln. sq. meters**




Source: Goskomstat, 2003

**Figure 5.8 Prices for 1 sq. meter of Real Estate by Quarter in Moscow, USD**




Source: www.realprice.ru

Mortgage lending is still in its infancy in Russia. At this stage it is only available to very narrow social groups with sufficiently high income. It is expected that the development of legislative mechanisms for mortgage lending will lead to a huge increase in the number of construction company's clients, creating a powerful impetus driving further increase in construction in the country.

### Commercial Estate Construction

Increased business activity and growing consumer market have generated substantial growth in this segment of the building market. Commercial estate construction (primarily hypermarkets, business centres and new storage facilities) is most developed in Moscow and St. Petersburg,

but also displays a considerable growth tendency in many other big cities around Russia. This segment of the Russian construction market is expected to be among the most rapidly growing in Russia in medium-term perspective.

The share of foreign companies in the market for commercial estate construction is much higher than in other market segments. This is due to the fact that foreign developers have great experience, use modern technologies, and also because the share of building contracts distributed on competitive (tender) basis is much higher in commercial estate building today than in any other segment of the Russian construction market.

### Industrial Construction

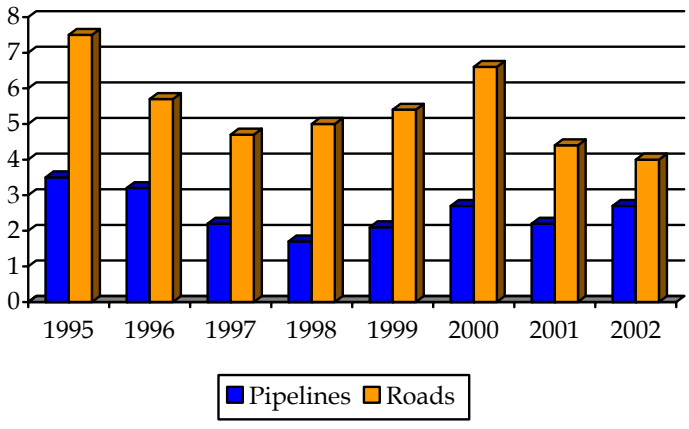
Growing investment in industry, which has been observed in the past years in the majority of branches, has lead to some increase in industrial building against the levels of 1990-ies. The most active construction is currently carried out by export-oriented industrial branches. These are above all the oil-and-gas industry, metals and forest industries. Food industry is the leader among non-export branches. Yet it should be noted that current volumes of industrial construction in Russia remain many times lower than the industrial construction in the last decade of the Soviet period.

At the same time prerequisites for substantial increase in the volume of industrial construction are in evidence in Russia today. High incomes from oil export have enabled the country to accumulate considerable financial resources, which, given that investment climate improves, may be directed into the development of various branches of national industry. Therefore this segment of the construction market holds a great promise of huge demand in the medium-term perspective.

### Infrastructure Construction

Infrastructure construction is in many ways driven by the fact that all main infrastructure objects (motorways and railroads, pipelines, transmission networks, wire communications, etc.) belong to monopolist companies controlled by the state. These monopolists act as

**Figure 5.9 Construction of Pipelines and Roads in Russia, thousand kilometers**




Source: Goskomstat, 2003

customers of infrastructure construction projects. Infrastructure building contracts are often distributed on non-competitive basis. Construction firms which have close ties with customers usually win such tenders. The infrastructure construction market is expected to become more open and competitive in view of medium-term plans for restructuring of state monopolies.

The fact that the state is actively investing in infrastructure today can be seen as a positive aspect of infrastructure construction market development. In particular, a whole number of large-scale projects is now being implemented in developing basic networks. This creates a favourable climate not just for infrastructure construction, but for other segments of the building market as well.

Finalizing this chapter, we would like to dwell on the main **challenges faced by the Russian construction cluster** that can have considerable influence on its development in medium-term perspective:

***Continued Growth of Russian Economy***

Political stabilization and economic reform in Russia are conductive to higher investment in all sectors of the economy, which creates favorable prerequisites for further development of the construction cluster. Growing income of communities drive increasing upward demand in the residential housing market.

***Instability of Economy and Its High Dependence on Conditions of the World Oil Market***

A fall in world oil prices may entail a sharp slow-down of economic growth and, consequently, lower construction volumes across segments.

***The Need for Renovation of Many Key Assets in Russia***

Due to insufficient investment in all sectors of the Russian economy throughout the 1990-ies, the country has accumulated enormous pent-up demand for renewal of the majority of key assets in industry, infrastructure, housing and communal services, etc.

***Amended Legislation for Real Estate***

Adopting a legislative base that will enable broad use of mortgage lending may result in a vast construction boom in residential housing segment.

***Mounting Competition***

Competitive environment in construction branch and production of construction materials is just beginning to appear. Development of competitive relations will result in higher quality of construction and broader range of supplied end-client services.

# 6. CONCLUSIONS AND FUTURE RESEARCH AGENDA

The current economic situation in Russia is on the whole rather favourable for the development of infrastructure clusters. This is due to the following main prerequisites:

- The overall economic growth owning to, in the first place, high global prices for energy and raw materials goods that form the core of Russian exports;
- The ongoing market reform of the Russian economy, which leads to tougher competition and the development of open pricing mechanisms;
- Increased internationalisation of the Russian economy, which provides infrastructure clusters with numerous new opportunities of international cooperation and integration;
- The high level of interest among other sectors of the Russian economy in infrastructure development, particularly since infrastructure issues have not been receiving proper attention in the Soviet days.

Today, the four clusters reviewed in our study – the energy cluster, the ICT cluster, the logistics cluster and the construction cluster – account for about 50% of the Russian economy. This figure, it should be noted, covers only the production of goods and services in the clusters' central areas – in other words, the output that the Russian statistics reflect for various sectors of the national economy. Consequently, the actual share of these four infrastructure clusters will in reality be even higher - given the production of goods and services in peripheral areas of the clusters and allowing for the necessary correction of insufficient and inadequate Russian statistical data.

The figure above is not as much an indicator of the very successful development of the said four clusters, as of severe disproportions that characterise the Russian economy today (in particular, the very high share of the energy sector, which accounts for over 30% of the entire production and over 50% of the country's export), evidencing ample opportunities for infrastructure owners to "skim the cream" off the nation's general economic growth. For that reason the shares of these clusters in the Russian economy are most likely to decrease in the future, which, however, does not mean that their growth will slow down.

The following negative aspects of the Russian infrastructure clusters can be said to play the key role in significantly restricting their development:

- Large and very large distances between the economic centres, as well as tough climate conditions ruling across most of Russian territory, which translate into much higher costs of maintaining and developing the infrastructure;
- Bad deterioration of all chief lines and terminals: very large investment is required in order to modernise these facilities;
- The excessively high degree of government regulation in most infrastructure branches, which holds in check the emerging entrepreneurial initiative and restricts the search for new unorthodox solutions to challenging problems;
- The absence of tested effective mechanisms of public-private partnerships established to implement infrastructure projects.

One additional negative characteristic describing not just the infrastructure clusters, but also the entire Russian economy, is the uncertainty about the direction and speed of further development that still looms large. Both internal factors (high dependency on political decisions made within the next few years), and external factors, arising from the currently high dependency of the entire Russian economy on the world energy and raw materials market conditions, play a significant role in this respect.

In our study we have conducted the preliminary analysis of Russian infrastructure clusters, which (just as other Russian clusters) cannot be called 'working clusters' yet. They should be viewed as potential clusters, possessing the most of necessary structural elements, but suffering from a shortage or low efficiency of many links and mechanisms that hold the cluster elements together.

The purpose of this study is a detailed analysis of each of these four clusters on the basis of the cluster approach and the model of competitive strength factors proposed by Michael Porter and subsequently elaborated and expanded by a number or European and American researchers. It is noteworthy that in the recent years the opportunities for analysing various sectors of the Russian economy, which were not available only a few years ago, have increased. This came as a result of Russian firms becoming increasingly more transparent, as well as of a more dynamic flow of information within the society.

As regards our future research agenda, we hope to be able to achieve the following main objectives:

***Determine the position of each of the infrastructure clusters in the contexts of Russian and global economy***

We intent to analyse the roles of the Russian infrastructure clusters in the Russian and international economies and identify the chief factors that influence clusters' positions. We also plan to conduct a benchmarking study of the Russian infrastructure clusters, matching them up against best international practices available.

***Analyse the clusters structure***

We intent to review all key elements incorporated in each given cluster, such as providers of key goods and services, technology producers, related and supporting industries, specialty inputs and consumers, placing them in historical perspective, but emphasising their current status. All these elements have certain specific characteristics that we cannot afford to overlook in the analysis of conditions that shape the institutional environment. We should especially aim to research the characteristic features of interaction between various elements of the clusters and identify synergy effects, missing links and bottlenecks. A clear picture of the structure of each cluster will enable us to better forecast its future development trends.

***Analyse competitive strength factors***

We intend to review key competitiveness factors for each cluster according to the "diamond" model proposed by M. Porter. Along with the analysis of publicly available statistical and analytical data for the entire sector and selected companies we will interview representatives of companies outputting key products, as well as representatives of companies operating in related industries and government officials responsible for regulating the respective economic sector. Also, in order to construct a more comprehensive picture, we will interview principal consumers of goods and services provided by each cluster. The analysis of competitiveness factors will enable us to identify strengths and weaknesses of each cluster, thus charting out directions and areas where targeted effort on behalf of the government and companies will yield most results.

***Evaluate the prospects of international cooperation***

We will review current international contacts of companies within each cluster: foreign trade, joint over-the-border projects, activities of foreign companies on respective Russian markets and Russian companies' operations abroad, as well as transfer of knowledge, tech-

nologies and workforce. As an outcome of this study we should be able to chart out principal areas of win-win cooperation and mark priority directions for furthering the cooperation and forming over-the-border clusters. We will also analyse global development trends that will impact the respective Russian cluster.

***Make recommendations for formulating multi-level industrial policies***

The outcome of our study will be strategic information used to evolve federal- and regional-level regulations, as well as measures focusing on specific market segments, aimed at furthering the development. The analysis of development trends for each cluster will help us to form a vision of instruments and mechanisms which must be employed in order to boost the investment appeal of each cluster, develop its competitive advantages and remove existing bottlenecks. Specific Russian conditions should be taken into account, as in many instances they call for a different interpretation of approaches tested and adopted internationally.

The authors hope that our work will contribute to furthering the understanding of ongoing processes of economic transformation in Russia, the strengthening of ties between Russian and foreign companies and tighter integration of the Russian economy into European and global networks.

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