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EMERGING CLUSTERS OF THE NORTHERN DIMENSION

Competitive Analysis of Northwest Russia – A Preliminary Study

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ABSTRACT: The study presents the initial results of research into the competitiveness and prospects for further growth of the industries of Northwest Russia. It also highlights the opportunities for over-the-border cooperation between Finnish and Russian companies. The structure and main features of seven key sectors of the Northwest Russia were examined. The forestry, base metals, energy, food and ICT sectors were studied using a method of cluster analysis. The study demonstrates that all the necessary elements for the formation of internationally competitive clusters are found in these sectors. The transport and logistics sector to a great extent determines the cost level and even competitiveness of local manufacturers. The construction materials industry benefits from natural resources, but it is fragmented and lacks the governmental and private efforts necessary for its development. Interviews with the executives of key companies and an analysis of what the sector needs showed that there is a high potential for over-the-border cooperation based on complementary resources, such as experience, technologies and the knowledge of global market by the Finnish companies, on the one hand, and the natural resources, cheap and highly qualified labor force, educational base, and broad local market that Northwest Russia offers, on the other hand.

KEY WORDS: Northwest Russia, Finland, Over-the-border cooperation, industrial clusters, competitive advantage, economic development, industrial policy

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TIIVISTELMÄ: Tutkimuksessa raportoidaan ensimmäiset tulokset Luoteis-Venäjän teollisuuden kilpailukykyä käsittelevästä tutkimusprojektista. Se myös valottaa Suomen ja Luoteis-Venäjän taloudellisen yhteistyön ja rajan ylittävän liiketoiminnan kehitysmahdollisuuksia. Tutkimuksessa esitellään seitsemän Luoteis-Venäjän johtavaa teollisuudenalaa. Metsä-, metallienjalostus-, energia-, elintarvike- ja ICT-sektoreiden rakennetta ja kehitystä tarkastellaan klusterianalyysillä. Tutkituilla aloilla on periaatteessa olemassa kaikki elementit, jotta niistä voisi kehittyä toimivia, kansainvälisesti kilpailukykyisiä klustereita. Lisäksi tarkastellaan logistiikkaa sekä rakennusmateriaaliteollisuutta. Logistiikka vaikuttaa merkittävästi klustereiden kilpailukykyyn. Rakennusmateriaaliteollisuus on kehittymätön – huolimatta runsaista luonnonvaroista – mutta kiinnostava, koska alueen kehittyessä rakentaminen lisääntyy nopeasti. Viennin lisäksi klustereiden muukin taloudellinen yhteistyö – strategiset allianssit, alihankinta ja suorat sijoitukset – on viriämässä. Kaupan rakenteen tarkastelu ja yhtiöiden näkemykset osoittavat, että rajan ylittävälle taloudelliselle yhteistyölle on hyvä pohja, koska kumppaneiden vahvuudet täydentävät toisiaan ja auttavat molempia kansainvälisillä markkinoilla. Suomi tarjoaa kehittynyttä tuotantoteknologiaa ja osaamista sekä globaalien markkinoiden tuntemusta. Luoteis-Venäjällä on luonnonvaroja, edullista ja laadukasta työvoimaa sekä hyvä koulutus- ja tiedeperusta ja sen kautta avautuvat portit Venäjän laajoille markkinoille.

ASIASANAT: Luoteis-Venäjä, Suomi, rajan ylittävä taloudellinen yhteistyö, teolliset klusterit, kilpailuetu ja taloudellinen kasvu, elinkeinopolitiikka

Preface

Russia is a combination of slow change and fast development. Ten years ago, the Soviet Union broke apart into separate market economies. This opened the gates for institutional reforms, entrepreneurship, market mechanisms and for new forms of innovation and development work. Social change was significant regardless if measured from the viewpoint of individuals, companies and production plants, or the public sector. Now that the world economy is stagnant, Russia has emerged to become one of the growth engines.

Economic development in Russia will bring wealth to Finland, too. The Russian market offers export opportunities for Finland as well as an important source of imports. Finnish companies are seriously considering opportunities for wider over-the-border economic cooperation and for locating business operations in Russia.

ETLA, the Research Institute of the Finnish Economy, has decided to carry out a large-scale project on the economic development of Northwest Russia. In an economic sense Northwest Russia is the most important area for Finland and Finnish companies among the seven federal districts of Russia.

The aim is, together with participating Finnish companies, to increase our knowledge of business activities in the region. There will be separate research reports on, at least, the Northwest Russian forest, ICT, basic metal and energy clusters, and a summary report combining all the results of the project.

The project is a joint project of the Center for Strategic Research (CSR) in Moscow, the foundation of which was initiated by President Putin, and Solid Invest, a consulting and research company in St. Petersburg. The aim of CSR is, with the help of the project, to develop the Russian industrial strategy, with Northwest Russia as an example, and at the same time make Russia a more appealing investment target and location for foreign companies.

We thank the Ministry of Trade and Industry in Finland for financing the project, the Center for Strategic Research for providing us with its expertise and data, and our hard-working research colleagues in St. Petersburg.

Helsinki, September 2002

Pentti Vartia

Author's Preface

This study is the first publication in a series of studies devoted to the development and competitiveness of industries of Northwest Russia. Within the framework of this project we intend to assess important issues and trends for the newly emerged clusters of economic activities in this region. There is an acknowledged and urgent need for new approaches and ideas related to industrial policies for this region. This information is also important for the decision-makers in neighboring areas, and principally in Finland.

The experience of elaborating approaches and working in these areas was very important and interesting for all participants of the project. We believe that the results could be extremely valuable for the purposes of facilitating the integration and development of both countries in question - Finland and Russia.

We would like herewith to express our gratitude to the Ministry of Industry and Trade of Finland (MTI), which commissioned and supported this study, and members of the Steering Group, Mr. Eero Jäntti (MTI), Mr. Matti Anttonen and Mr. Timo Kienanen (Ministry of Foreign Affairs of Finland), and Mr. Timo Laukkanen (Confederation of Finnish Industries and Employers). Many thanks also to Russian and Finnish companies that provided valuable input and took part in discussions, interviews and case studies in the project.

The authors would like to acknowledge the industry experts and analysts who provided their valuable insights into the project. They are: Andrey Averin - ICT cluster; Sergey Boltramovich - general description of Northwest Russia, transport and construction materials industries and forest cluster; Vladimir Gorelov - the metal and metal-working cluster; Dmitry Efremov - the forest cluster; and Alexey Osipov - the energy cluster. The authors are also very grateful to the other members of the research team for their valuable efforts in obtaining and processing data: Dmitry Belov, Natalia Ivanova, Vasily Murashov, Stanislav Redman, Anton Savchenko, Piia Walden and Melina Laakso.

We hope that the ideas and approach will be both interesting and valuable for the reading audience of this work.

Helsinki, June 2002

Grigori Dudarev, Hannu Hernesniemi and Pavel Filippov

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Executive Summary

The present study attempts to assess the opportunities and changes arising from the transition to the market economy in Russia, and associated changes in the structure of bilateral trade. It also presents an analysis of prospects and trends in the economic development of Northwest Russia, based on an examination of clusters of economic activity in this geographical region in relation to the development and structure of the Finnish economy. The main purpose here is to provide a new framework and valuable ideas for possible aims and directions of a Northern Dimension initiative, and for decision-makers who are interested and involved in policy matters related to the economic development and integration of Northwest Russia and Finland. The area of Northwest Russia in the present study is considered to coincide with the borders of the newly created Northwest Federal District of Russia, which is also a new feature in assessing the economic area near the border with Finland.

In Chapter 1 of the study, we present the main ideas and aims of the study in more detail, as well as a general introduction into the economy of Northwest Russia. This Chapter makes clear that Northwest Russia is more oriented towards manufacturing and processing than other areas of Russia. During recent years, the most rapidly developing areas of economic activity in the Northwest have been food processing and information and communication technologies (ICT). We also see that general industrial production grew rather fast in this region.

The structure and development of bilateral trade between the economies of Russia and Finland and the clusters of industrial activity of both countries are considered in Chapter 2 of the present study. The analysis shows that the most important economic activities and clusters in both areas are identical (forest, metals, energy and ICT, primarily). An analysis of trade demonstrates that the clusters are for the most part complementary and do not compete on global markets, thus creating substantial opportunities for over-the-border integration and cooperation. The enormous potential of bilateral investments and business development was also assessed in this chapter, as evidenced in trial projects that are being carried out already by the largest participants.

In Chapter 3, we turn to a more detailed analysis of the structure and competitiveness of the Northwest Russian clusters. This analysis provides a good basis for considering possible alternatives for further de-

velopment of Northwest Russia. This chapter also examines agglomerations and concentrations of industrial activities, as well as related networks.

Chapter 3 is devoted to an in-depth study of the forest cluster in Northwest Russia. There are virtually no synergies and no horizontal cooperation in the development, logistics, etc., of new products and markets in the cluster, due to the remoteness of the companies from each other, their historically established specializations, regional barriers and growing transport tariffs.

The competitiveness of the regional forest industry on international markets is cost-based, and determined, primarily, by vast and cheap forest resources, relatively low (in comparison with Western Europe) energy and transport tariffs, and low labor costs. The main export articles are raw wood and low value-added products. Achieving a better understanding between domestic businesses, foreign investors, and government is highly desirable if the country is to develop its long-term export ability in this sector.

In the next chapter, we analyze metals and metal processing in the region. This area was traditionally a center of metal production and processing in Russia. In the 1990s, industrial production in the cluster shifted to the production of metals, due to their competitiveness on the global market in contrast to the products of metal processing industries. Today, metallurgy is one of the backbones of the Russian economy. It is concentrated around the manufacture of low value-added, mass products of the low process stage. Its competitiveness is based on the low costs of raw materials, labor and energy. The market structure in this sector has already been formed. The ownership of key companies is concentrated in the hands of a limited number of the private owners, and in this sense, the cluster can be considered as one of the most advanced in Northwest Russia.

Issues related to the energy cluster are addressed in Chapter 5. The energy cluster in Northwest Russia today is primarily concentrated in a small number of large companies operating throughout Russia. They enjoy limited competition as a result of an industrial structure inherited from the Soviet period. Most energy companies are regional monopolies today. Significant changes in the energy sector are expected only after competition has been introduced. It is thought that this could lead to considerable changes in the structure, efficiency and investment attractiveness of the energy sector. The development of the energy cluster in Northwest Russia is stimulated by transit trade and the processing of raw materials from other regions. Already today, St. Petersburg

and the Leningrad region are the hubs through which natural gas, oil, petrochemicals, coal, electric power, and other commodities are exported to Western markets. The growth of the transit of energy products creates further opportunities for establishing new industrial facilities (oil refineries, power plants, etc.) in the region. This could also create new opportunities for related engineering and technology companies, and conditions for closer cooperation between local suppliers.

Chapter 6 of the study is devoted to issues related to the development of the fastest growing cluster of Northwest Russia - the food cluster. The food industry of Northwest Russia is the only industry that has experienced a shift in development towards more sophisticated products in recent years. Northwest Russia is domestically competitive and an important agglomeration of food industries: the relative share of Northwest Russia in total domestic production and processing of fish and other sea products in 2000 was 26% (34% of fish production); in beer production 23%; and in dairy 12%. Fish and sea products are the most important export items in the food cluster of Northwest Russia.

Following global trends, the ICT cluster (Chapter 7) in Northwest Russia is also rapidly growing. It enjoyed spectacular growth in demand for final products, which led to a growth in sales and penetration into the market of cellular network operators. As the market continues to grow, in combination with the substantial human and industrial capital inherited in this area from the Soviet period, there is good potential for the development of import-substituting manufacturing. This can not only benefit the domestic market, but also, under certain circumstances, become internationally competitive, given the attractive cost of labor and skills accumulated in this area. An advanced educational infrastructure with renowned achievements (first-prize winners in programming contests, etc.) also adds to the potential for the development of competitive manufacturers of products and services in this region. Today, St. Petersburg is already a very important data transmitting hub for the whole of Russia (connecting to Finland), which could help to advance this location as advantageous for certain kinds of services and products, as well. St. Petersburg is also one of the main offshore programming centers in Russia at present, adding substantially to the prospects for further development of sophisticated solutions in this cluster overall.

The subsequent chapters examine two important and rapidly growing areas of activity in Northwest Russia. These are the construction materials industries, which are based on availability of natural resources, re-orientation and scaling of regional production capacity in

proportion to the local and domestic market size and vertical integration (integration of materials manufacturing into building), and the transport and logistics sectors, originating in the position of St. Petersburg as the largest trade hub and gate to global networks for Northwest Russia. The development of transport networks is an essential precondition for the integration of the area, and for the whole country, into the global economy. This process is complicated by the substantial investments in infrastructure, which are essential for making this activity globally competitive and efficient.

The last chapter of the study summarizes general issues that are important for further development of over-the-border cooperation and integration, based on interviews and the opinions of experts. It aims to provide ideas for policy and decision-making related to the aforementioned development of over-the-border activities. It stresses the enormous potential and benefits for both countries, Finland and Russia, arising from such development, which is predicated on/results in the possibility for the convergence and reduction of the gap in the GRP per capita between the regions.

1 Introduction

1.1 Purpose of the Study

The events of the past decade, i.e. the collapse of the Soviet Union and consequent independence, and the start of economic and political reforms in Russia, significantly altered the industry and trade between Finland and Russia. After the free market was introduced in Russia, a painful period of transition, lasting more than 10 years, followed. It led to the formation of a new industrial structure. Clusters of industrial activity founded on the market-based allocation of resources replaced regional industrial complexes developed in the Soviet period by decisions of the Communist Party and State. Thus, the regional concentration of trade has changed. The product structure of international (including trade between Russia and Finland) and domestic trade also changed substantially, as the markets adjusted to the unrestricted demand of consumers.

Another important influence in trade between Russia and Finland was the fact that the clearing agreement that regulated bilateral trade in the Soviet period was abandoned in 1992. This also instigated significant changes in certain industries of Finland and Russia. As a result, trade between the countries today is based on market mechanisms and prices. At present, trade reflects much better competitiveness of Finnish products on the Russian market and of Russian products on the Finnish market. Russia and Finland have been important, strategic trade partners a long way back in history. For this reason, an analysis of recent changes, combined with the study of changes in the industrial structure, can provide useful insights and ideas for decision-makers in both countries. The main targets of the study are, therefore, the following:

- To assess changes in the industrial structure by identifying competitive clusters of industrial activity in the Northwest of Russia,
- To assess the key factors underlying the development and impact of the newly created clusters on future trade between Russia and Finland,
- To assess the changes in trade patterns and opportunities arising from such changes.

In the present study, we have identified the five clusters, which will be the most important ones for Northwest Russia in the future. These are the energy, forest, metals and metal-processing, food and ICT clusters. In addition to an assessment of these clusters and related changes in trade and business activity between Russia and Finland, special studies of construction materials and transport sectors were carried out, which are also important and helpful in assessing the potential for development of trade between the two countries.

The study was implemented in the following manner:

- Critical analysis of extensive statistical and other research materials collected from official statistics and other public sources was carried out.
- Case studies and analysis of the companies in different clusters and industries were made.
- Interviews with the top executives of the leading companies were conducted concerning their views on the sectors' competitiveness and trends in development, as well as possibilities for over-the-border co-operation

1.2 Northwest Russia and Its Economy

General

The Northwest Federal District (NWFD) is one of the seven federal districts in Russia, established in May-June 2000 by Decrees of the President of the Russian Federation.

It includes: the Republic of Karelia, Republic of Komi, Arkhangelsk region, Nenetsk Autonomous District, Vologda region, Kaliningrad region, Leningrad region, Murmansk region, Novgorod region, Pskov region and the City of St. Petersburg.

The administrative center of the NWFD is the City of St. Petersburg.

In the Soviet period, the territories that are now included in NWFD, belonged to the Northwest (Leningrad, Novgorod, Pskov regions and Leningrad city), North (Arkhangelsk, Vologda, Murmansk regions, Nenetsk Autonomous District and Republics of Karelia and Komi) and Baltic (Kaliningrad region) economic districts.

Figure 1.1 The Northwest Federal District.

The introduction of federal districts in Russia reflects the tendency towards improving law enforcement and coordination between the federal government and the subjects of its jurisdiction. It is an attempt to overcome regional separatism and to improve economic and political coordination of the federal subjects inside the District.

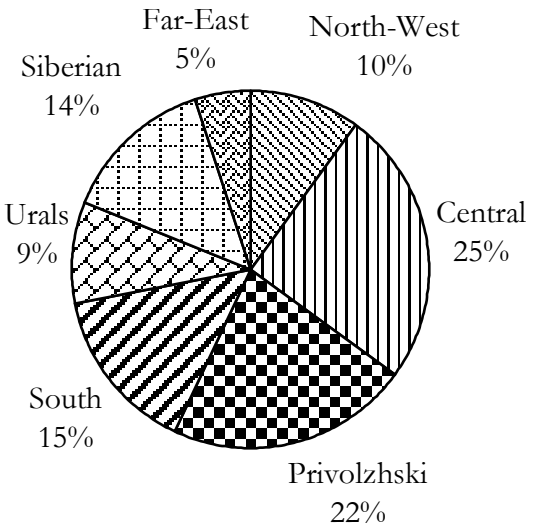
Currently, the main purpose behind the introduction of federal districts is to bring the regional legislation in conformity with the federal legislation and to adopt local regulations for more effective inter-regional cooperation.

Northwest Russia in Comparison with the Other Federal Districts

The area of the NWFD is almost 1,680 thousand sq. km., which is 9.8% of the total territory of Russia. This is the largest federal district in the European part of Russia. The population as of January 1, 2000 was 14,515 million people, or 9.9% of the total population of Russia. Northwest Russia occupies the 5th place among federal districts, according to the number of its residents.

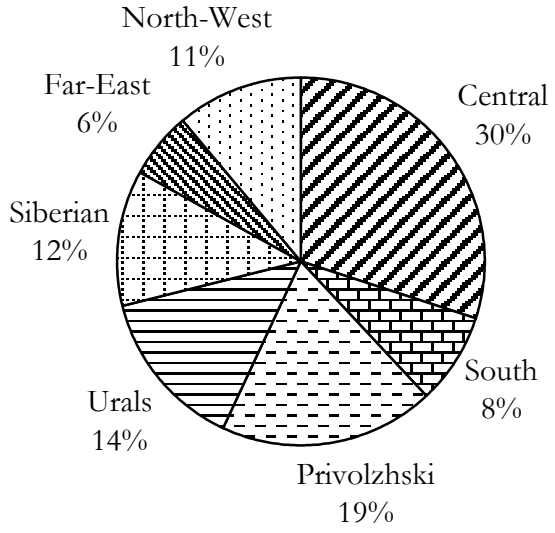
There is a strong correlation between the dynamics of the GRP of Northwest Russia and the development of the industrial sector. In the period from 1995 to 1997, the fall in production, primarily in the processing industries, led to a considerable reduction of the share of the NWFD in the total GRP of Russia: from 10.6% to 9.4%. According to

Figure 1.2 Distribution of the Population of Russia by Federal Districts in 2000, % of the Total Population.



Source: Goscomstat, Statistical Yearbook of Russia, 2000

Figure 1.3 The GRP of Federal Districts in 1999, % of the Total Russian GRP.



Source: Goscomstat, 2002

to the information of 1999, however, the relative portion of the NWFD in the total GRP rose to 11% (5th place) and 30,800 rubles (4th place) *per capita*.

The volume of production output in 2000 amounted to 11.8% of the total production output of Russia (5th place), and 33.400 rubles *per capita*. This is more than the average in Russia and the second only to Russia's main oil- and gas- producing district,the Urals. In comparison with the other districts, the NWFD is noted for higher production efficiency and labor productivity, especially in the processing industries.

Table 1.1 The GRP per Capita by Federal Districts in 1999, RUR.

Russia	28,550
Urals Federal District	45,890
Far East Federal District	35,050
Central Federal District	33,140
Northwest Federal District	30,800
Privolzhski Federal District	24,860
Siberian Federal District	24,410
Southern Federal District	15,930

Source: Goscomstat, 2002. Note: "GRP" corresponds to the EU concept "Regional Value Added"

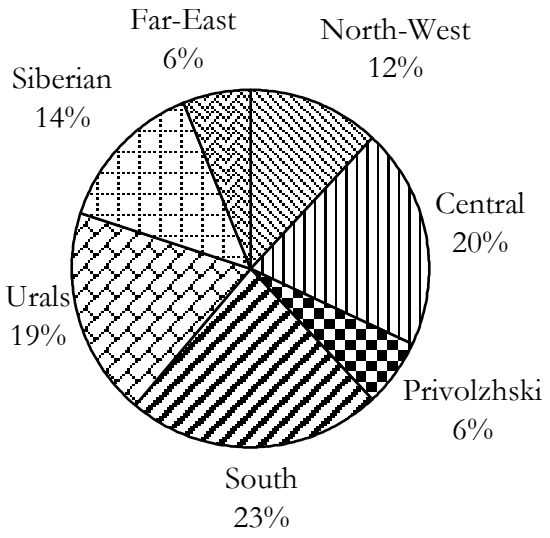
The dynamics of industrial production in Northwest Russia conformed on the most part to the overall Russian dynamics. Between 1991 and 1998, the index of industrial production fell more than twofold (48.4%). This was, however, a better performance when compared to other regions during this period.

The largest decline in production in the NWFD (as in the country as a whole), occurred in 1994. After this time, production continued to decrease for some time, albeit at a slower pace. The first increase in production was recorded only in 1998.

In the year 2000, the volume of industrial production in the NWFD increased by 16.5% as compared to the previous year (in Russia as a whole by 9%). Unlike other districts, there was growth in all 11 regions of the NWFD. After 1998, there was also a noticeable increase in the share of the NWFD in the total volume of Russian industrial production, from 9% in 1997 to 11.8% in 2000.

Northwest Russia was the region most strongly oriented towards the processing industry, when viewed against the Russian average. There were the following areas of specialization: machine building (power

Figure 1.4 Industrial Production by Federal District in 2000, %.



Source: Goscomstat, Socio-economic situation of the Northwest Federal District of Russia, 2001

engineering, shipbuilding, instrument making, etc.), ferrous and non-ferrous metallurgy, forestry, mechanical wood-processing and pulp-and-paper. All these industries taken together represented more than 50% of the total.

Table 1.2 Industrial Production per Capita by Federal District in 2000, RUR.

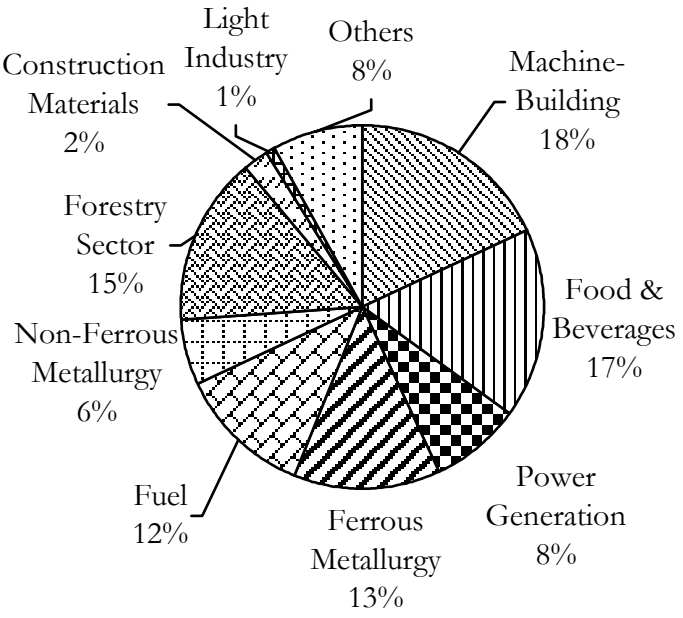
Russia	32,600
Urals Federal District	61,800
Northwest Federal District	33,400
Far East Federal District	32,100
Privolzhski Federal District	31,100
Siberian Federal District	26,600
Central Federal District	22,300
Southern Federal District	11,200

Source: Goscomstat, Socio-economic situation of the Northwest Federal District of Russia, 2001. Note: "Production" corresponds to the EU concept "gross production" here.

A comparatively small portion of the energy industry (in comparison with such industrial districts as the Urals and Privolzhski) is characteristic

of the Northwest Federal District - it represents only 20% of the total industrial production.

Figure 1.5 Industrial Production Structure in the Northwest Federal District in 1999.



Source: Goscomstat, Socio-economic situation of the Northwest Federal District of Russia, 2001

During recent years, the food processing and the ICT sectors developed most actively in the Northwest District. The growth of the food industry was largely determined by the previous recession and import substitution. The ICT is concentrated in St. Petersburg. Its innovations were encouraged by the inflow of a qualified labor force and a large demand.

All the land within the territory of the NWFD is considered risky for farming, and agriculture has a small relative significance (about 10% of GRP and about 7% of the entire agricultural production of Russia in 1999). Flax cultivation (18.1% of agricultural production in Russia in 2000), poultry farming, dairy and cattle-breeding and the cultivation of potatoes are the main areas of activity in agriculture.

Table 1.3 Key Strengths and Weaknesses of the Russian Northwest.

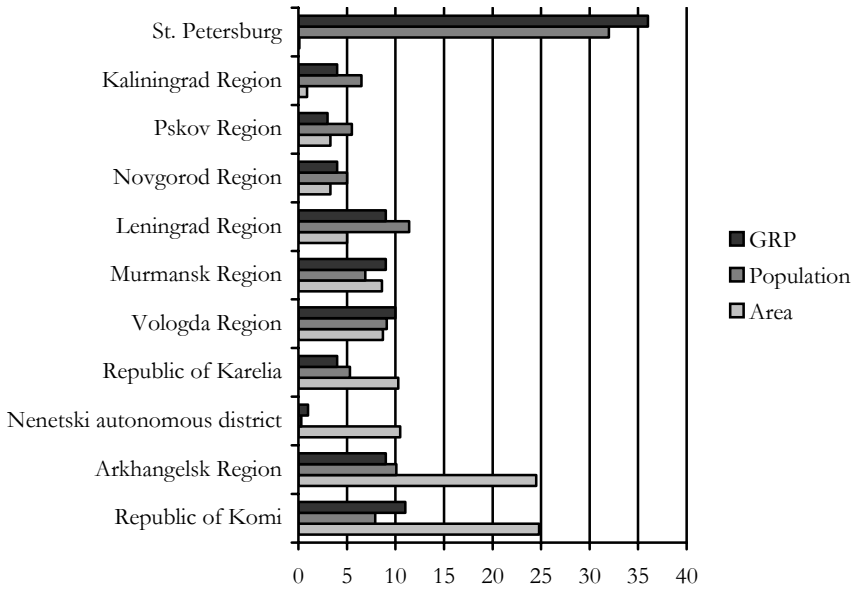
Strengths	Weaknesses
• Substantial raw material resources (oil, gas, ferrous and non-ferrous metal ores, wood) • Inherited industrial assets and infrastructure • Inherited educational system and R&D in St. Petersburg, Petrozavodsk, Vologda and Arkhangelsk • Inherited human capital (skilled labor force) • Agglomerations of industrial activity • Export potential of leading industrial sectors • Advantageous geographic location next to the Western Europe and its markets • Transport logistics gateways in St. Petersburg, Murmansk and Arkhangelsk	• Uneven distribution and low density of population and infrastructure, especially in the areas rich in raw materials • Poor, worn-out infrastructure • Logistics bottlenecks • Lack of intraregional coordination and industrial policy • Lack of financing to build networks for modern communications and transport • Limited availability of the qualified workforce and rapid aging of existing professionals • Stagnancy of R&D, aging of the researchers, lack of international cooperation • Excessive number of monopolies • Long distances from manufacturers to consumers • Severe climate and related higher costs of production and living

In terms of foreign investments, the NWFD is only a step behind the Central Federal District of Russia, with 16.3% of Russia's total foreign investments in 2000. These investments are distributed very unevenly inside the NWFD, however more than 86% were allocated to St. Petersburg and the Leningrad region. The food, tobacco and pulp-and-paper industries, transport, communication, trade and catering are the most attractive sectors for foreign investments today. The flow of financial resources into machine building has also begun.

Northwest Russia Regions

Among the regions included in the NWFD, the Republic of Komi occupies the largest area (415.9 thousand sq. km), the Archangelsk region has the second largest area (410.7 thousand sq. km without Nenetsk Autonomous District), and the Kaliningrad region and St. Petersburg occupy the smallest areas (15.1 thousand sq. km and 1.6 thousand sq. km respectively).

Figure 1.6 Area, Population and GRP of the Northwestern Regions in 1999, % of the total.



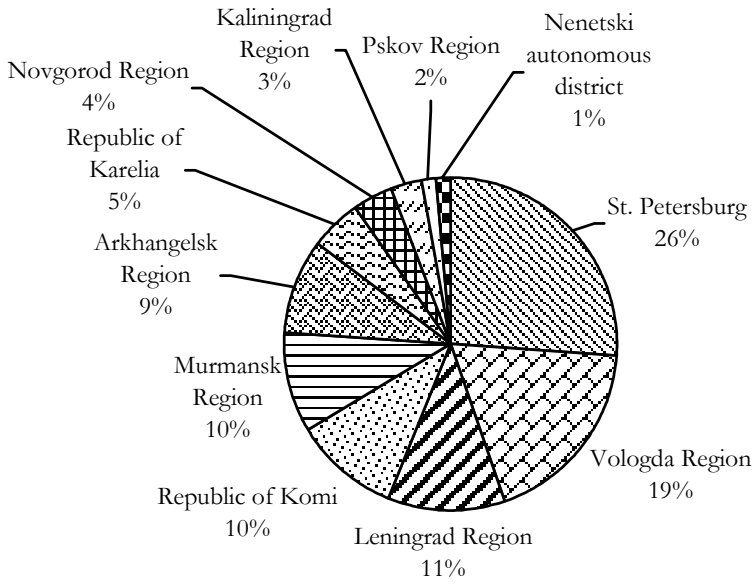
Source: Goscomstat, Statistical Yearbook of Russia, 2000

The most densely populated regions are St. Petersburg (4,695,000 people in the beginning of 1999 - almost 1/3 of the population of the NWFD) and the Leningrad region (1,673,700 people); the least populated are the Republic of Karelia (771,100 people) and the Nenetsk district (45,500 people).

In 1999, St. Petersburg represented more than one third of the total GRP of the district and had the highest GRP *per capita*. The Republic of Komi and the Murmansk region also had a relatively high GRP *per capita*.

In terms of industrial production, St. Petersburg and the Vologda region were the leaders, while the Pskov region and Nenetsk Autonomous District were the least developed in Northwest Russia.

Figure 1.7 Industrial Output by Region of Northwest Russia in 2000, %.



Source: Goscomstat, Socio-economic situation of the Northwest Federal District of Russia, 2001

The second place rating of the Vologda region in industrial output *per capita* is ensured by a high output of Severstal, the Cherepovets-based steel manufacturer, which produced two times more than the whole Novgorod region in 2000. In 2000, in comparison with 1999, the regions with the largest growth in industrial production were the Kaliningrad, Arkhangelsk, Leningrad regions and St. Petersburg (more than 25%), and those with slower growth were the Novgorod and Murmansk regions (less than 6%).

The leading position of the Nenetsk District in output *per capita* can be explained by its relatively high oil production, and its small population. The high positions of the Murmansk region (3rd) and the Republic of Komi (4th) can also be explained by the high value of their main products (Murmansk region - non-ferrous metals, Komi - oil and gas) and their small populations. St. Petersburg's 8th-ranking position is connected to the recent dynamic growth of the service sector (61% of the city's GRP in 1999) in comparison with manufacturing.

Each region has its distinct industrial orientation, which is summarized in Table 1.5 below.

Table 1.4 Industrial Output per Capita by Region of Northwest Russia in 2000, RUR.

Nenetsk Autonomous District	137,400
Vologda Region	69,000
Murmansk Region	47,600
Republic of Komi	44,900
Leningrad Region	32,900
Republic of Karelia	31,300
Arkhangelsk Region	32,000
St. Petersburg	27,100
Novgorod Region	25,900
Kaliningrad Region	15,600
Pskov Region	9,500

Source: Goscomstat, Socio-economic situation of the Northwest Federal District of Russia, 2001

Along with the above-listed key industries, there are also some traditional activities, such as flax and butter production in the Vologda region, amber in the Kaliningrad region, mining and the chemical industry in the Murmansk region, flax production in the Novgorod and Pskov regions, and reindeer breeding in the Nenetsk District.

Among the 150 largest companies of Northwest Russia, 57 are located in St. Petersburg (28% of the total sales); and 57, as well in the Republic of Komi, Leningrad, Arkhangelsk and Vologda regions taken together (52.6% of total sales). At the same time, only three companies from the list are located in the Pskov region (the largest one, Pskovenergo, occupies the 104th position in terms of sales volume).

The industries of Northwest Russia are less oriented towards the initial production and processing of raw materials than Russia overall. Only three out of the top 15 companies (by sales) belong to the oil and gas industry, while in the rest of Russia, 9 out of the top 15 are from this industry.

In the Soviet post-war period, the regional industrial complexes were created[1]. By the mid-80s, a large industrial complex in Northwest Russia had been formed. Links between enterprises were very complex and implied narrow specialization. The processing industry was developed in the city of Leningrad, and the Leningrad, Vologda, Novgorod and Pskov regions. Raw materials were delivered here from other regions of Northwest Russia, e.g. ore and chemicals from the Murmansk region and

[1] Kolosovsky N.N. Theory of economic regions, Moscow, 1969.

Republic of Karelia, and coal, oil and gas from the Republic of Komi. The regions specializing in processing industries, supplied the fuel-and-energy and mining companies with equipment, machinery, products of the chemical and light industries, and with food.

The collapse of the centrally-planned state economy in the 1990s had a ruinous impact on inter-regional corporate links. Administrative obstacles, aimed at the greater independence of each separate administrative unit of the Federation, new frontiers formed after the break-up of Soviet Union, and a sharp reduction of the domestic market resulted in a locking-in of economic activity within the region, and led to a reorientation of the leading manufacturers from domestic markets to exports.

Table 1.5 Industrial Specialization of the Northwest Russian Regions.

Region	Specialization
Republic of Karelia	Forest industry, ferrous metals
Republic of Komi	Oil and gas, forest industry, power production
Archangelsk Region	Forest industry, machine-building
Nenetsk Autonomous District	Oil and gas
Vologda Region	Ferrous metals, chemicals
Murmansk Region	Non-ferrous metals, power production, fishing
St. Petersburg	Metal-processing and machine-building, food & beverages
Leningrad Region	Petrochemicals, power production, forest industry
Novgorod Region	Chemicals, food & beverages
Pskov Region	Food & beverages, machine-building
Kaliningrad Region	Fishing, machine-building

Today it is clear that re-integration and the reestablishment of cooperative ties between companies develop on the basis of market allocation of resources and persisting personal contacts. One of the most important preconditions for economic integration is the specialization and technological dependence of many enterprises on products manufactured by their partners in the Soviet period.

The indisputable economic leader in the NWFD today is its administrative center, the city of St. Petersburg. In the 1990s, it became a kind of "test field" for market reforms. This led, on the one hand, to the numerous negative consequences of artificially accelerated privatization, but it favored the formation of a competitive environment, on the other.

Table 1.6 Top 15 Companies (by Sales) of Northwest Russia in 2000.

	Company	Region	Branch	Sales in 2000, USD million.	Profit after taxes in 2000, USD million	Number of employees, thousand people.
1	Severstal	Vologda Region	Ferrous metallurgy	2,101.1	624.3	44.5
2	KirishiNefteOrg-Syntez	Leningrad Region	Chemical and petrochemical industry	571.0	146.2	6.1
3	Kolskaya Mining and Metallurgy Company	Murmansk Region	Non-Ferrous metallurgy	569.9	229.7	16.5
4	Severnaya Verf	St. Petersburg	Shipbuilding	531.6	102.8	2.8
5	SeverGazprom	Republic of Komi	Oil and gas industry	380.5	44.6	11.9
6	LenEnergo	St. Petersburg	Power production	363.3	0.96	18.3
7	Petro	St. Petersburg	Tobacco	318.6	- 0.9	2.1
8	Baltika Brewery	St. Petersburg	Food and beverages	317.0	75.9	3.7
9	Apatit	Murmansk Region	Chemical and petrochemical industry	295.1	14.6	15.3
10	Akron	Novgorod Region	Chemical and petrochemical industry	290.9	32.3	10.3
11	KomiTEK Oil Company	Republic of Komi	Oil and gas industry	250.9	78.2	No info
12	Syktyvkarski LPK	Republic of Komi	Forestry	242.7	67.4	5.4
13	Kotlas Pulp&Paper Mill	Archangelsk Region	Forestry	240.9	27.1	9.7
14	Baltiyski Zavod	St. Petersburg	Machine-building	234.3	- 0.4	6.1
15	Polyarnoe Siyanie	Archangelsk Region	Oil and gas industry	226.5	90.25	No info

Source: Expert RA, 2001

The second group consists of the Vologda, Leningrad, Murmansk, and Arkhangelsk regions and the Republic of Komi, which together provide 60% of the industrial products of the NWFD. At the same time, the Republic of Komi, the Murmansk and Arkhangelsk regions, as well as the Nenetsk District, have the highest development potential, due to the concentration of the most significant natural resources in their territories.

The Republic of Karelia and the Novgorod, Pskov and Kaliningrad regions are still on the periphery of economic development in the district. The top priority for the Novgorod region is to attract investments and to create more economic activity in the city of Novgorod (similar to the role of the city of Cherepovets in the Vologda region). The Republic of Karelia and the Pskov and Kaliningrad regions should also benefit from their location on international borders (the Pskov region is the only region in the Russian Federation that borders three countries) and their proximity to the markets of Western Europe.

The Kaliningrad region is an exclave of the Russian Federation. Its political status is being re-determined at the moment. Its economic links with other Northwest Russian regions are less important due to its remote location.

1.3 Contents of the Study

As we have already discussed, the present study aims to assess the effect of changes in the economy of Northwest Russia during recent years on trade and economic integration with Finland. In order to do this, we first look at the pattern of Russian-Finnish trade and over-the-border business and development in the chapter "Finnish-Russian Cross-Border Business Activity." Here we study the competitiveness of Russian products on the Finnish market, as well as competitive Finnish products on the Russian market. In addition, examples of existing over-the-border business activities in the five main clusters are described.

The section "Emerging Clusters of Northwest Russia" contains brief studies of seven key sectors of the region's economy. Such sectors as forest, metal, energy, ICT and foodstuff were analyzed, together with related and supporting industries, using the cluster approach (based on M. Porter's book *Competitive Advantage of Nations* and the latest developments in this field), while transport and construction materials industries are described separately. The chapter also summarizes trends in development and future expectations of the clusters.

In the chapter "Views on Future Development," we report on the results of interviews with top executives of the key companies, together with our own assessment of the development potential of the sectors under consideration, giving their views on the sectors' development trends and prospects for international cooperation.

In the last chapter, "The Primary Issues and Tasks in Improving Russian-Finnish Cross-Border Cooperation," we enumerate and comment on different ways of improving over-the-border cooperation.

2 Finnish–Russian Over-the-border Business Activities

The rebirth of Russia in 1991 was the point of departure for a new era in trade and economic cooperation between Finland and Russia. Some of the fundamental changes that occurred are as follows:

- Trade in commodities and services can now be based on the real needs of consumers and companies. In addition, business is now conducted directly, without any intermediaries.
- Companies can now operate relatively freely in the neighboring country, Finnish companies in Russia, and Russian companies in Finland. Russia has opened its doors to foreign companies, and Russian companies were given a freer hand to operate abroad.

These are important changes, which will have a great impact on the economic relations between Finland and Russia. The substance of trade and economic cooperation will differ from that of the Soviet period. Today, Finnish companies are able to purchase or establish subsidiaries in Russia, subcontract to Russian companies, and freely build distribution networks in Russia. Similarly, Russians can participate in economic activities in Finland and cooperate with Finnish companies. The formation of networks in product development, production and marketing will contribute positively to economic developments on both sides. Competitive clusters expand beyond the limits of the border. This is why advancing economic development in Northwest Russia and the viability of its companies is important for Finland.

In principle, economic relations now closely resemble those prevailing in 1811-1917, when Finland was an autonomous part of Russia. Freedom of trade and location, however, is not yet as fully developed. On the other hand, there are also remarkable differences between the two periods of time. Company operations are more global today, and the significance of the proximity of the two countries is not as great as it once was. Transportation costs, the shelf life of goods, etc. do not restrict exports to the degree that they did 100 years ago. Improving competitiveness and specialization requires that the market be conquered globally for many commodities . One remarkable change is that Finnish companies are now stronger, and they are able to acquire Russian businesses. One hundred years ago the situation was the reverse.

How brisk can trade between Finland and Russia become? The following historical study evaluates the potential of Finnish-Russian trade. It is possible that within 20-30 years, trade between Finland and Russia will reach levels currently recorded between Finland and Sweden, or even Finland and Germany. Germany is Finland's biggest trade partner, accounting for 14% of its exports.

Special Study: The Role of Russia as a Trade Partner

The role of Russia as a trade partner for Finland has gone through remarkable changes throughout history. During the period when Finland was an autonomous part of the Russian Empire, Russia accounted for 30-40% of Finnish exports. After Finland became independent, at the beginning of the Soviet period, the situation changed. Russia's share in Finnish exports was less than five per cent, and trade between the two countries practically ceased for several years before the war. 1945 marked the beginning of a new period. Russia's share in Finnish exports increased significantly, varying between 15 and 25%. The economic difficulties experienced by the Soviet Union during the last few years of its existence were reflected in a decline, and eventual collapse, in trade.

In 1992, the newly formed Russia accounted for less than 3% of Finnish exports. By 1997, its share had risen to 7%, before the country's economic difficulties and currency devaluation dropped the ratio to just slightly above 4%. In 2000 and 2001, exports recovered and grew at a robust pace of over 30%. Russia's share in our exports has already risen up to 6%.

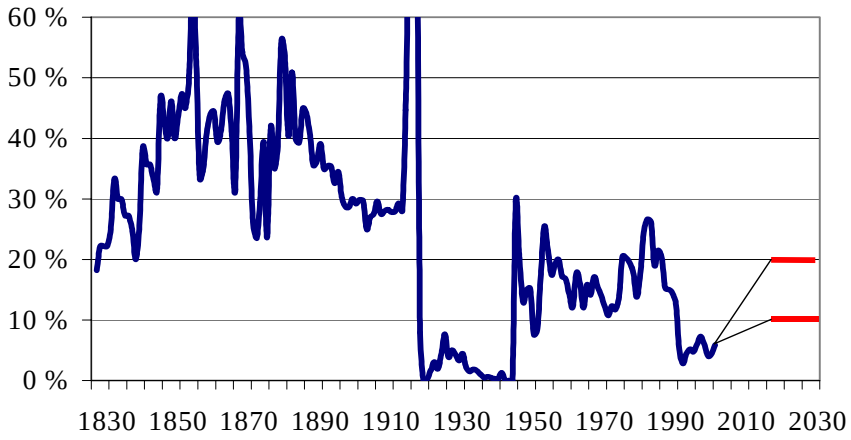
Today, Russia supplies nearly 10% of Finnish imports. Finland imports a large amount of energy raw materials from Russia. Increasing prices are the reason for the large deficit in Finland's trade balance with Russia. This explains in part the growth in Russia's share within Finnish imports, as well. In a historical perspective, the share of imports has been approximately on the same level with exports.

The importance of the role Russia might play in the Finnish economy in the future is an intriguing question. If the market economy in Russia continues to make progress and rapid economic growth continues, and if liberal rules are set for world trade and economic cooperation, we will be in virtually the same situation that we were in during the period of autonomy. Russia's share in Finnish exports could be as much as 20-30%. On the other hand, industry today must manufacture products that are globally competitive. Therefore, Russia as a nearby market cannot be as important as it was during the period of autonomy. If we endorse the gravitation model of trade and the

catching-up model, Russia's share in Finnish exports could rise to the level of Germany's, which is 14.5% of imports and 12.4% of exports[2] In this case, Russia's export share would be nearly equal to that of the Soviet Union in the post-war periods. In those days, the image of Finland as a good capitalist trade partner contributed to the growth of exports destined for the Soviet Union.

It is interesting to compare Estonia and Russia as export destinations. The population of Estonia is 1.3 million people, while Russia's population is 145 million. Finland's exports to Estonia in 2001 amounted to EUR 1,058 million, and EUR 2,806 million to Russia. Although the share of Finland in Estonia's imports is extraordinarily high - over 20% - it is anticipated that trade with Russia will grow remarkably when Finnish companies, as part of their strategy, seriously begin conquering Russia, as they did in Estonia.

Figure S2.1 The Share of Russia in Finnish Foreign Trade in 1830-2000.



In the following section, we will look at the substance of trade between Finland and Russia. Our goal is, on the one hand, to determine which Finnish products are competitive in the Russian market, and, on the other, which Russian products are competitive in the Finnish market. We will also try to assess future prospects for trade.

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[2] According to gravitation models, trade between countries is dictated by their population, income level and proximity to each other. According to catching-up models, economic growth in developing countries is faster than in developed countries, and, eventually, living standards in different countries will converge.

In addition to trade, we will also examine the location decisions of companies and will consider how they locate in the new situation. What kinds of investments have Finnish companies made in production, trade, logistics, etc. in Russia? Similarly, we will look at the kinds of business activities Russians have been involved with in Finland.

The analysis of the substance of trade between the countries is based on customs statistics in Finland and other OECD countries. As for direct investments, the survey is based primarily on the information provided by companies themselves. Statistics on direct investments, as well as other overall studies on the internationalization of Finnish and Russian companies, are the framework of the analysis.

2.1 Finland's Exports to Russia

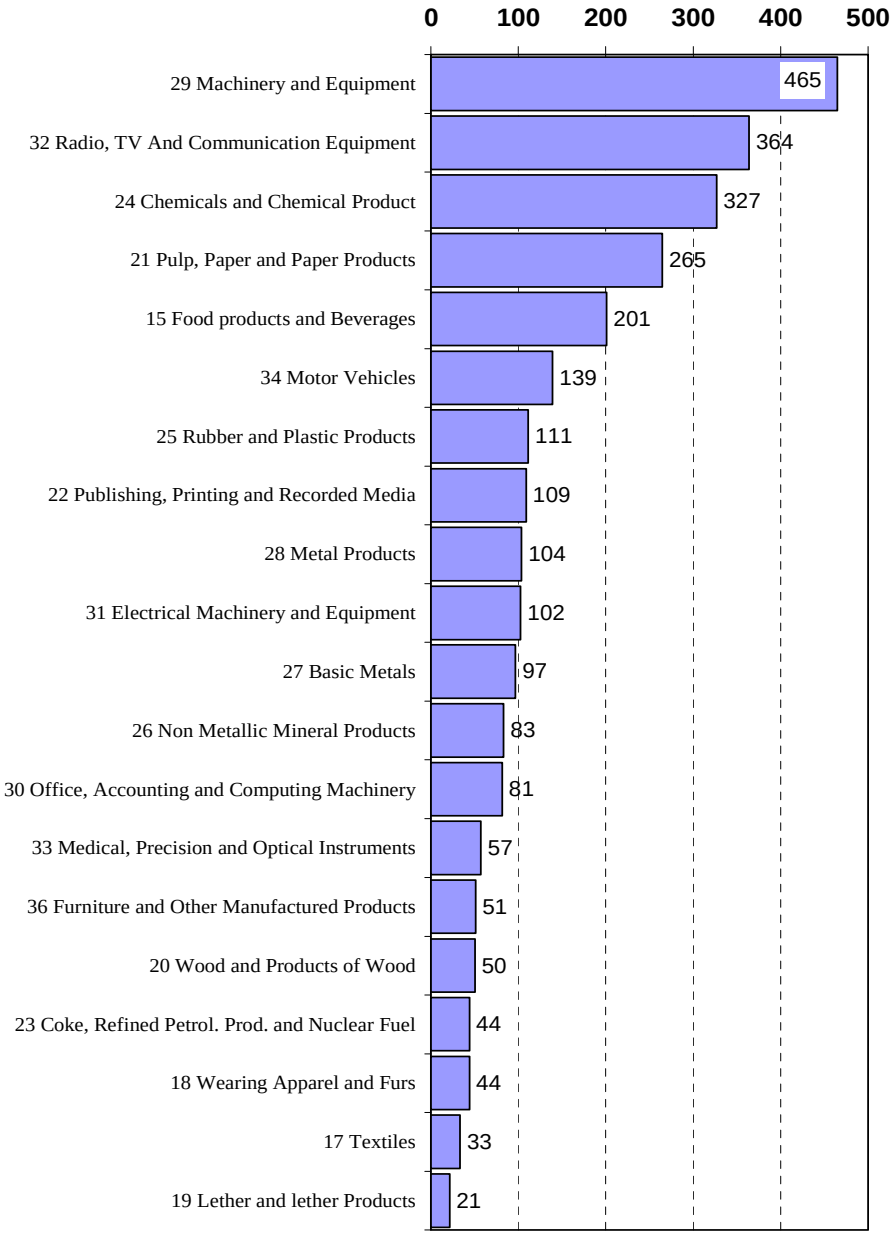
Main Characteristics of Finland's Exports to Russia

Finland's exports to Russia cover a wider range of commodities than its imports from Russia. The number of companies exporting from Finland to Russia is much larger than the number of those importing from Russia to Finland. Imports from Russia will be examined more closely in Chapter 2.2. A general conclusion, however, is that imports from Russia consist mainly of a few raw materials, and the number of Russian companies dealing in them is relatively small.

Figure 2.1 shows Finnish exports to Russia grouped according to types of businesses, so that each group includes typical commodities for a given sector. The largest exporter is machinery and equipment, with EUR 465 million of exports. The transmission apparatus industry sent EUR 364 million of exports to Russia. The next largest groups are producers of chemicals (EUR 327 million) and the pulp-and-paper industry (EUR 265 million). The food industry managed to export just over EUR 200 million of goods as well.

These sectors represented 51% of Finnish exports to Russia. Within the sectors, however, there are various subgroups, which differ in raw materials, production technology and customer profile. Below, the groups are divided into subgroups showing the country's actual export ability.

Figure 2.1 Finland's Exports to Russia in 2001, EUR million.



Source: Finnish National Board of Customs, Ultika database

- **Machinery and equipment:** household equipment, EUR 115 million; power engines, EUR 66 million; machine tools, EUR 42 million; lifters and transmitters, EUR 38 million; refrigerating and ventilating systems, EUR 25 million; paper industry machinery, EUR 23 million; and agriculture and forestry machines, EUR 19 million. With the exception of household equipment, the rest of the machinery is investment goods. In two years, exports of this machinery have already exceeded their previous peak, recorded in 1997. This suggests that investments in production technology have started to increase.
- **Equipment for radio, television and telecommunications**: There are no subgroups for this export grouping. According to statistics on exported goods, the largest share in this group is occupied by mobile phones and network equipment.
- **Chemicals:** varnishes and printing inks, EUR 110 million; plastics, EUR 49 million; detergents, cosmetics and toiletries, EUR 29 million; and medicine, EUR 17 million.
- **Pulp, paper and cartonboard:** paper and **cartonboard,** EUR 178 million; paper and **cartonboard** products, EUR 76 million; and pulp, EUR 10 million.
- **Foods and drinks**: dairy products, EUR 69 million; drinks, EUR 37 million; and meat and meat products, EUR 11 million.

The Russian market is also an important export destination for printing houses, exporters of cars and other motor vehicles, manufacturers of rubber and plastic products, and manufacturers of metal products.

Certain strong clusters - the telecommunications cluster (mobile phones) and the forest cluster (writing and printing papers) - play an important role in Finnish exports. As Russia's standard of living rises, the demand for products manufactured by these clusters will grow, and the relative importance of Russia as a market will increase. Trade in construction and construction components and building materials will also grow, as Russia's standard of living increases.

The product structure of Finnish production technology meets Russia's demand. Russian companies need technology in the forest industry, for telecommunications operations, in power production and consumption, as well as in the food industry and the food trade. Various transmitters and lifters, mobile machines and vehicles are needed in all lines of business, including the mining industry, construction and transportation.

There are export opportunities for so-called near market products as well, such as foodstuffs. The Finnish food industry is competitive comparing to those of Russia and Baltic countries. There is a demand for furniture, and even for footwear, textiles and clothes, although in these sectors Finland's international competitiveness is relatively weak. This may be an intermediate period or a time for visitation. Russia itself is developing strong, high-quality products to meet its demand, thus threatening Finland's position. It may be the right time for industries serving such consumer markets to establish local production.

Finland is also a bridgehead, a transition country for exporting , for example, cars, household appliances, consumer electronics and other products to Russia, products in which Finland is not very competitive, with the exception of some specific goods. However, arbitrage and logistics via Finland are realized very successfully. In addition to these products, there are, naturally, actual transit goods, for which Finland is only a transit route. In this area, as well, Finland specializes in more expensive products than its competitors, the Baltic countries, i.e. in products for which safety, promptness and highly-developed distribution logistics are important. In this study, however, we will not analyze transit exports[3].

Finland's Competitive Edge in the Russian Market

The competitiveness of Finnish products in the Russian market was measured by three criteria: the volume of exports, export surplus, and Finland's share of total Russian imports from OECD countries. Imports from OECD countries cover approx. 75% of total Russian imports, reflecting imports from developed industrialized countries in particular. The table below lists the 30 most important export commodities of Finland. The commodity classification used in the table covers more than 6,000 items, which means that the commodity level is very detailed. In order to get comprehensive data on exports which covers all OECD countries, we had to use the latest available information from the year 1999.

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[3] For transit and arbitrage trade, see Kaitila ja Arkonsuo: Transitioliikenne ja välityskauppa Venäjälle, ETLA B 163, 2000 Helsinki.

Table 2.1 Top Products in Finland's Exports to Russia, 1999.

		Exports to Russia, $ million	Russia's share, %	% of OECD exports	Trade balance $ million
Total		1,674.3	4.0	7.9	-586.3
852520	Transmission apparatus, for radiotelephone incorporative? reception apparatus	69.5	2.0	32.3	69.5
870323	Automobiles w reciprocatg piston engine displacg > 1500 cc to 3000 cc	48.3	6.8	13.4	48.2
854011	Cathode-ray television picture tubes, inc video monitor tubes, color	44.8	99.8	91.4	44.8
490290	Newspapers, journals and periodicals, nes	43.4	43.3	63.9	43.4
845011	Automatic washing machines, with a dry linen capacity not exceeding 10 kg	38.1	65.1	34.0	38.1
481011	Paper, fine, woodfree, in rolls or sheets, </=150 g/m2, clay coated	32.9	4.1	56.7	32.9
482359	Paper, fine, cut to size or shape, nes	23.4	6.5	82.8	23.2
321490	Non-refractory surface preparations for facades, walls, floors, ceilings	22.3	73.0	65.3	22.3
491110	Trade advertising materials, commercial catalogs and so on	21.6	22.2	69.4	21.6
151710	Margarine, excluding liquid margarine	20.4	75.9	20.2	20.4
040500	Butter and other fats and oils derived from milk	19.9	30.5	22.1	19.9
481091	Paper, multi-ply, in rolls or sheets, clay coated, nes	19.0	2.5	77.3	19.0
110710	Malt, not roasted	18.0	67.5	20.9	18.0
730890	Structures & parts of structures, i/s (ex prefab bldgs. of headg no.9406)	16.5	10.3	25.6	13.3
847192	Input or output units, whether or not presented w/the rest of a system etc	16.0	8.4	6.8	16.0
401110	Pneumatic tires, new of rubber for automobiles incl station wagons & racg cars	14.4	14.0	40.9	14.4
321519	Printing ink, nes	13.5	53.3	32.3	13.5
320810	Paints & varnishes based on polyesters, dispersed in a non-aqueous medium	13.0	36.0	63.0	13.0
870190	Wheeled tractors nes	12.8	3.6	58.0	12.4
721070	Flat rolled prod, i/nas, painted, varnished or plast coated, >/=600mm wide	12.7	13.6	65.3	12.7
848180	Taps, valves and similar appliances, nes	11.6	7.3	10.2	11.5
040630	Cheese processed, not grated or powdered	10.8	73.1	41.0	10.8
950410	Video games for TV	10.8	67.6	92.1	10.8
320890	Paints & varnishes based on polymers dissolved in a non aqueous solvent nes	10.4	32.2	25.3	10.4
870324	Automobiles with reciprocating piston engine displacing > 3000 cc	10.1	84.9	4.7	9.9
350510	Dextrins and other modified starches	9.7	44.4	61.6	9.7
870899	Motor vehicle parts nes	9.6	10.0	14.3	9.4
340319	Lubricating & similar prep containing >/=70% petroleum oils, nes	9.5	71.1	39.1	9.5

2.2 Russia's Exports to Finland

Main Characteristics of Russia's Exports

Russia exports only a few commodities to Finland: crude oil and natural gas (EUR 1,460 million in total), coke and oil products, nuclear fuel (EUR 481 million in total, mainly oil products), forestry products (EUR 396 million), base metals (EUR 301 million), and chemicals (EUR 286 million). The imports of these five largest commodity groups cover 85% of Finland's imports from Russia. Hence, Finnish imports from Russia are strongly oriented towards raw materials and energy.

Finland is very dependent on imports of many of these products. The country's dependency on natural gas was 100% in 2000, and 90% of imported electricity and 85% of imported timber was Russian. Almost half of the crude oil, and more than half the oil products, come from Russia. In coal, the share of Russian imports was over 40%. Russia is also an important country for Finnish imports of scrap metal. Russia accounts for a high Finnish import share of fertilizers (58%), iron and steel (30%), and sawn and planed timber (35%).

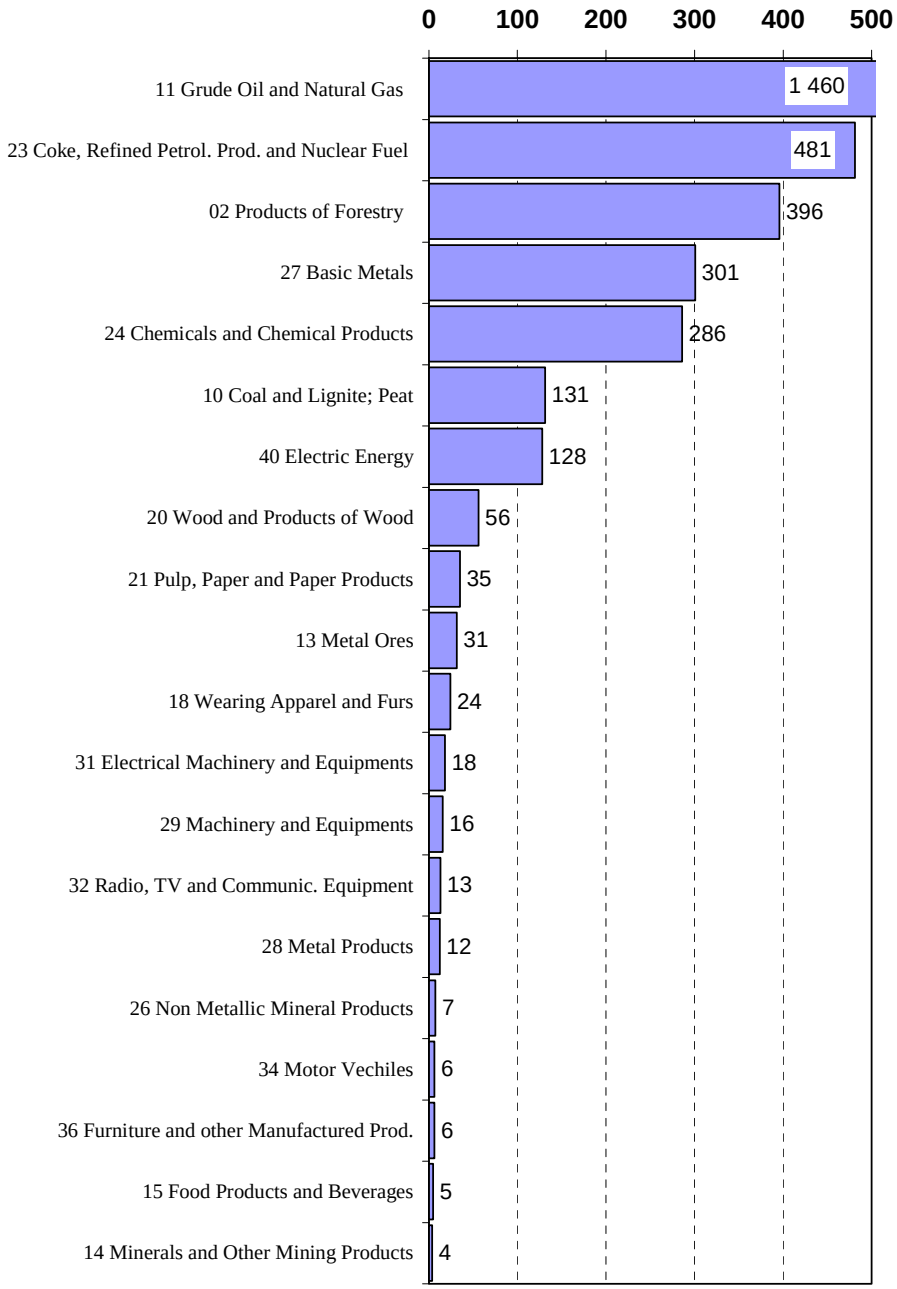
The question of whether these high import ratios are a risk factor for securing supply is, of course, essential for Finland. Gas imports cannot be replaced by imports from another country, but only by other fuels, which has led in fact to multi-fuel solutions in power stations and industry. Importing timber is necessary because, in practice, timber consumption in Finland exceeds the actual output from our own forests. Importing timber from another country is possible, but hardly in such large volumes and with the same amount of flexibility. Part of Finland's metal-processing industry is completely based on using scrap, and even when scrap is only part of the raw material input, it is a necessary and virtually irreplaceable component. Any import restraints cause significant problems to Finnish industry and.

The concentration of trade on relatively few products, and Finland's dependence on Russia, severely limits growth in trade. It is not possible to increase import levels substantially if there is no guarantee for continuous and regular supplies. In addition, there is a need for large investments, such as those involved in extending the gas pipeline to the Turku region and the oil pipeline to the Porvoo refinery. Since other commodities are imported in relatively small quantities, there are few opportunities to increase the total volume of imports. Still, the value of trade can fluctuate significantly, depending on the prices of oil and other commodities.

The structure of trade will not, however, remain unchanged. The following changes, or at least indications of coming changes, can be observed:

- Russia has started to invest in processing its own timber in Finland and is striving for Finnish export markets. The value of timber imports was as high as EUR 56 million.
- Similarly, the Finnish forest industry is exploring opportunities for both mechanical and chemical wood processing in Russia, near the sources of the raw material. Such investments would inevitably increase the imports of higher value-added products to Finland as well, although the exports would primarily be channeled to the world market.
- Finnish printing houses have also started to import and use Russian paper for, e.g., printing newspapers. Paper and carton board imports amounted to EUR 27 million.
- There has been significant growth in imports of iron ore pellets and slabs, which is due to rational business strategy. Rautaruukki has started to process the semi-products of Severstal and other Russian steel factories. The company also imports iron ore pellets from Kostamus produced by a subsidiary of Severstal. In 2001, imports of iron and steel from Russia amounted to EUR 174 million. During the last four years, imports of basic chemicals have doubled, reaching a level of EUR 286 million. This may be due in part to the same type of strategic division of labor as in the steel industry. On the other hand, it may be due to the significantly better price competitiveness of Russian manufacturers of fertilizers, for example.
- Perhaps the most interesting phenomenon is the development of subcontracting activities and, consequently, growth of imports. In the electronics industry, subcontracting activities have increased in four years from zero to EUR 13 million. Imports of electric machinery and equipment, such as electric motors and cables, have almost tripled, to a level of EUR 18 million. The role of subcontracting is also important in the clothing industry, the imports of which amounted to EUR 24 million in 2001.

Figure 2.2 Russia's Exports to Finland in 2001, EUR million.



Source: National Board of Customs, Ultika database

Russian manufacturers of final products have not been able to enter the Finnish market. Thus far, Russia's exports to Finland have only met the import demand of Finnish companies. Business is conducted with major Finnish customers. For example, such companies as Lenenergo and Lukoil could strive to compete in the wholesale and retail markets for their products, but so far there have been no signs of this happening.

Russia's Competitive Edge in the Finnish Market

The competitiveness of Russian products in the Finnish market was measured by three criteria: the volume of exports, export surplus and the share of Russia in total Finnish imports. The table also has a column indicating Finland's share in total Russian exports to OECD countries, i.e., the importance of our market compared to other OECD countries. The table below lists the 30 most important export commodities. The commodity classification in the table covers more than 6,000 items, which means that the commodity level is very detailed. Again, the comprehensive data of 1999 was used.

From the commodity analysis we can draw the important conclusion that Finland and Russia have balanced intra-industry trade only in a few commodities. Consequently, in mutual trade Finland and Russia are not competitors. Their mutual trade is specialized, supplementing the supply in the other country's market, or is a necessary part of exports to third countries as raw material or semi-finished product, or as a manufacturing technology.

Table 2.2 Top Products in Russia's Exports to Finland, 1999.

		Exports to Finland, $ million	Russia's share, %	% of OECD imports	Trade balance $ million
Total		2,260.6	7.1	5.1	586.3
270900	Petroleum oils and oils obtained from bituminous minerals, crude	616.8	42.1	5.6	616.8
271121	Natural gas in gaseous state	262.7	100.0	8.5	262.7
440399	Logs, non-coniferous nes	203.7	85.0	72.9	203.7
440320	Logs, poles, coniferous nes	130.5	86.1	14.4	130.5
271600	Electrical energy	106.8	52.7	96.8	106.7
720421	Waste and scrap, stainless steel	52.3	85.2	31.5	52.2
720712	Semi-fin prod, iron/n-al steel, rect/sq cross sect, cntg by wgt<.25% carb	49.6	91.3	18.8	49.6
270112	Bituminous coal, whether or not pulverized but not agglomerated	39.8	30.4	7.6	39.8
750210	Nickel unwrought, not alloyed	30.1	84.7	4.0	30.1
262090	Ash and residues containing metals or metallic compounds nes	25.5	88.9	95.9	25.5
260112	Iron ores & concentrates, other than roasted iron pyrites, agglomerated	24.9	50.6	26.9	24.9
840130	Fuel elements (cartridges), non-irradiated, for nuclear reactors	24.1	35.1	14.8	24.1
760200	Waste and scrap, aluminum	23.8	74.8	5.9	23.8
290110	Saturated acrylic hydrocarbons	23.5	99.1	72.0	23.5
290250	Styrene	22.0	29.9	54.7	22.0
281410	Anhydrous ammonia	21.3	95.3	33.5	21.3
740311	Copper cathodes and sections of cathodes unwrought	21.1	90.7	2.5	21.1
440710	Lumber, coniferous (softwood) 6 mm and thicker	18.5	79.7	3.6	18.0
760110	Aluminum unwrought, not alloyed	17.3	57.8	0.6	17.3
480100	Newsprint, in rolls or sheets	14.3	84.7	6.1	14.2
310590	Fertilizers nes, in packages not exceeding 10 kg	13.4	97.6	79.1	13.4
720449	Ferrous waste and scrap, iron or steel, nes	10.6	74.0	2.1	10.6
390120	Polyethylene having a specific gravity of 0.94 or more	9.9	23.6	19.4	8.2
310420	Potassium chloride, in packages weighing more than 10 kg	9.5	61.7	7.2	9.5
440121	Wood in chips, coniferous	9.4	40.5	54.1	9.4
260500	Cobalt ores and concentrates	9.3	8.7	84.8	9.3
290511	Methanol (methyl alcohol)	8.3	65.6	26.0	8.3
290531	Ethylene glycol (ethanediol)	8.0	98.8	28.3	8.0

2.3 Direct Investments and Other Over-the-border Activities

Cumulative direct investment from Finland to Russia amounts to EUR 314 million, according to the balance of payments statistics of the Bank of Finland. The statistics on small and medium-sized enterprises are not comprehensive, which means that in reality the investment rate is somewhat higher. The Confederation of Finnish Industry and Employers has studied the regional distribution of personnel and sales of Finnish industrial companies. In 1999, sales in Russia amounted to EUR 1,282.0 million, representing 1.1% of the total sales of the companies examined. It may be worthy of mention that in Sweden the sales were 6.8% of their total sales. Again, 1.1% of the total personnel of Finnish companies, or 4,907 employees, were located in Russia. Sweden accounted for 9% of the personnel, i.e. 41,132 persons. Sales per person in Russia are at an average level, and above the level of sales of, for example, Sweden. This reflects the emphasis of operations on commerce rather than on production.

According to *Statistics Finland*, there were 20 Russian-owned companies in Finland in 1999. They employed 907 people, and their total sales amounted to EUR 1,530 million. The high total and average sales figures are due to the fact that these companies are sales companies. The largest companies in 1999 were the following: Oy Teboil Ab (oil trade, turnover EUR 761 million, personnel 268), Suomen Petrooli Oy (oil trade, turnover in EUR 438 million, personnel 204), Oy Konela Ab (automobile wholesale and retail, turnover EUR 192 million, personnel 443), Crudex Oil Products Oy (wholesale, turnover EUR 40 million). This list is not necessarily a comprehensive one.

What is the contact area in Russia of the companies representing different clusters and especially their operations in Northwest Russia? This question was studied on the basis of discussions with company representatives, public bulletins and other available information on investment projects. The situation is analyzed by cluster. Thus, the review presented below is inevitably somewhat informal.

The Forest Industry Cluster

For the companies operating in the Finnish forest cluster, Russia is an important producer of essential raw materials. Annual imports of raw timber amount to approx. 13-15 million m^3. The unhindered continuation of timber imports will continue to play an important role in the future, as well. Exports to Russia are becoming increasingly important for the forest industry. In the Soviet period, Russia was an important export

market for the producers of forest industry machinery. At present, the market consists of moderate upgrades, deliveries of automation products and sales of spare parts.

Finnish wood-processing companies have invested relatively little in Russia. The most important investments have been the investments of Stora-Enso in the forest harvesting company Ladenso in Karelia and in the Balabanov packaging factory near Moscow, and the investments of UPM-Kymmene in the Chudovo birch plywood factory in Novgorod. Now UPM-Kymmene is expanding its Chudovo plywood mill to include a new veneer line in 2002. In addition, the company has decided to invest 30 million euros in a new sawmill (capacity 200,000 m3). It will also be locate in the Novgorod region. Metsäliitto Group has bought the Finnish company Thomesto, which actively operates in Russia and the Baltic countries trading timber.

At the moment, however, all three large wood-processing companies are investigating opportunities to build or buy production plants in Russia, and in Northwest Russia in particular. They are proceeding with the projects quite cautiously. Before making any investments they want first to consider the optimal locations, long-term availability of timber, logistics, availability of labor, etc. They also want to be sure about the protection of investments and other factors related to the legal environment. There are reasons for this caution. Making a greenfield investment in a pulp mill can cost as much as one billion euros, which is three times more than all the previous cumulative investments made by Finnish companies in Russia.

In any case, Russia is the next object of interest for Finnish wood-processing companies. Buying old production plants in Europe is not as profitable as it used to be, since the factories with the best development potential have already been purchased. Investments in Asia and South America typically meet resistance by environmental movements. Conquering America has proven to be costly. "Northwest Russia is an unused fiber stock near the market," and this makes it interesting. Growth in the Russian domestic market makes it even more interesting.

Finnish forest machinery producers are looking forward to an investment boom in the forest industry, since in the present situation this would bring them relatively secure and large deliveries. The investments of Finnish and other foreign companies would mean additional exports for forest harvesting machinery exporters as well. Harvesting volume would increase, and there would be new demands for the quality of raw materials, delivery times and reliability. This would increase the demand for Scandinavian-style harvesting machines. After machinery producers

come suppliers of various services. In order to be competitive, they all must invest in a local presence and subcontract with local companies.

Taking into account the strong position of the Finnish forest cluster and the reduction of barriers to investment, we find it likely that Northwest Russia will integrate into the Finnish forest cluster. Moreover, in the long term, geographical expansion will surely not stop here.

The Metal Industry Cluster

Russia has a strong metal industry. The most important companies in Northwest Russia are the non-ferrous metal refiner Norilsk Nickel and iron and steel producer Severstal. Norilsk Nickel is the leading company in the world measured in terms of its raw material supplies. In terms of production volume, Severstal is the third largest Russian company in its field, but it has perhaps the most promising prospects for the future. In addition, Northwest Russia has extensive aluminum production. Refining activity is based largely on the region's own raw material inputs. Exports are important, but so are domestic customers, such as the automobile industry. Compared to the forest cluster, cooperation and competition with Finnish companies are far more comparable.

Among the Finnish metal industry companies, Outokumpu and Rautaruukki cooperate with Russian companies. Outokumpu has a cooperation agreement with Norilsk Nickel. The agreement covers technological development and supply of technology to modernize and expand the production of Norilsk, and development of metals, metal products and their raw material production, as well as possible joint ventures. It has been agreed that Outokumpu will modernize the Nadezhda nickel foundry in Norilsk, and will supply a new ore-enrichment plant to Norilsk, as well as expanding another one in Talnakh. The total value of these agreements could exceed 200 million euros during 2002-2003.

Rautaruukki is an important buyer of Severstal products, as mentioned above. Rautaruukki's rolling mill capacity exceeds its blast-furnace capacity. This difference, and the need for raw materials during the repairs of blast furnaces, are covered by the production of Severstal. Rautaruukki has also invested in a steel service center in St. Petersburg, in order to become the leading steel and metal product supplier in St. Petersburg and its environs. The service covers pre-processing services of steel, as well. Rannila, part of the Rautaruukki Group, produces roofing and other building components in St. Petersburg. Another branch of Rannila is located in Taldom, Moscow region.

Russia is now an important supplier of scrap for Avesta-Polarit and Imatra Steel. Avesta-Polarit exports its products to Russia. It competes with only relatively small domestic competitors in the stainless steel market. The main competitors are from Western countries. Demand for stainless steel is, nevertheless, much lower than in Western countries. Imatra Steel does not export long engineering steels to Russia yet. However, there could be demand for its highly machinable steels and forging steels in the growing automobile industry and in other machine manufacturing.

Kuusakoski collects ferrous metals, aluminum and nickel scrap from Northwest Russia. There are collecting points in St. Petersburg, Petrozavodsk, Murmansk and Archangelsk. Aluminum is refined further in the company's subsidiaries in Vyborg and St. Petersburg. The company's aim is to influence the authorities so that its line of business will be considered as recycling activity and its operations will be subject to public regulations like any other normal business. At the moment, a considerable part of the Russian scrap business is a part of the "gray" economy. If normal operations become more common, the competitive situation will improve.

Finnish producers have much technology to supply for automating mines, metal factories, mining, mineral enrichment, and smelting. Sandvik-Tamrock is strong in rock-drilling equipment. Metso Minerals is a world leading producer of products, solutions and services for rock crushing, construction and mining industries. Metso Minerals' wide product range consists of: rock drills, crushers, screens, feeders, grinding mills, enrichment equipment, slurry pumps, pressure filters, materials handling equipment, pyroprocessing equipment and compaction and paving equipment. Outokumpu has leading technology for use in a wide range of industries, from ore enrichment to metal forming. The technologies of the companies partly overlap, which causes some competition among them. Competition between Metso Automation, Outokumpu and Rautaruukki can be observed in automation as well. Depending on the project, they either compete against each other or cooperate with each other. Finland's proximity, well-functioning logistics and knowledge of the local conditions help the technology companies to compete for investment projects of Russian mines and metal factories.

The Finnish metal industry has a long way to go to create its market in Russia. The strategic cooperation with local producers described above will contribute positively to this. Another strategy consists of introducing new products. For example, copper pipes were not used in water pipelines during the Soviet period. Replacing non-durable iron pipes with copper pipes is an enormous undertaking. Copper was not used as roof-

ing material, either, and it is still regarded as risky, due to theft. System products of steel construction have already found a promising market in Russia. The sales of pre-refined metal sheets are expected to grow in the future. There are many ways to move further, but new and systematic development of the market channels is needed.

The Food Cluster

The pioneer in the internationalization of the food industry in Russia and the Baltic countries has been the beer industry. Finnish Hartwall and Carlsberg Breweries share the ownership of Baltic Beverages Holding (BBH), which owns as many as eight breweries in Russia, two in Ukraine and four in the Baltic countries. BBH is Russia's leading beer company, with a 34% market share. Its flagship is the Baltika brewery in St. Petersburg, which produces the most well-known brand of beer. Sinebrychoff, which is now part of the Carlsberg brewery, owns the Vena brewery in St. Petersburg. The third important Finnish beer producer, Olvi, has begun production in Estonia and Lithuania, but is interested in the Russian market as well.

According to the management of Hartwall, the success factors of BBH are the following. The company has acquired the majority share of the local leading breweries by investing new share capital in them. The local brands, management and ownership have remained the same. Quality has been improved to meet Western standards by using new technology, and through extensive personnel training. In beer production, they have concentrated on the higher quality segments that offered the best sales growth. Capacity expansion, new purchases and improvements in the distribution system have boosted production volume. In addition, the parent companies have given their support in marketing, distribution, purchases and finances. Now they are attempting to repeat their success in beer with non-alcoholic beverages.

Of all the food companies, only Fazer has had confidence in local production. It owns the Hlebnij Dom[4], the Murinsky and Vasileostrovsky bakeries in St. Petersburg. Together these correspond to about one-fourth of the bakery product market of St. Petersburg. Chloetta Fazer exports both sweets and chocolate. Leaf exports pastilles produced in Finland. So far, the company has invested in organizing as wide a distribution as possible.

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[4] "Bread House" in English.

Valio and its brand names, especially Viola, are very well known in Russia. Valio products entered the market early, in the Soviet period. They were considered high-quality products and status symbols. This has contributed significantly to Valio's exports of cheese and butter to Russia. According to the company, the availability and quality of the raw material, primarily milk, is not adequate for guaranteeing large-scale, high-quality production. Therefore, the strategy so far has been to improve the efficiency of production and distribution in Finland, and export the amount that exceeds the demand in the domestic market.

After the ruble devaluation in 1998, the food industry in Russia has been the fastest growing sector. The rise in import prices following the devaluation allowed domestic production to substitute exports and meet most of the increased consumer demand. Consumer behavior has also changed significantly. Consumers' initial fascination with foreign products has disappeared. People have returned to well-known national flavors and recipes. In addition, people in Russia have started to trust more the hygiene and quality of domestic foodstuffs, which is a common feature in other countries, too. These factors, and occasional problems (customs treatment, import prohibitions, slow customs procedure), speak in favor of establishing local production in Russia. The Finnish food industry actually needs Russia and the Baltic countries for expanding its area of operations in order to manage growing international competition. Due to its proximity and manageability, Northwest Russia is a good starting point for establishing production in Russia. St. Petersburg in particular, will become one of the centers of the food industry and a focal point for wholesale trade of food in Russia.

The ICT Cluster

There are three areas of over-the-border cooperation in the ICT cluster: (1) teleoperations and data transmission, (2) equipment sales and production, and (3) programming.

Sonera is perhaps the most experienced Western telecommunications company operating in Russia. It has long been a stockholder of Northwest GSM, which operates in St. Petersburg and Northwest Russia. At the end of 2001, Sonera participated in establishing MegaFon, which is the first operator covering all of Russia, except very low-density populated rural areas. The largest owners of MegaFon are Telecominvest (31%), Sonera (26%), Central Telegraph Mobile (26%), and Telia (8%).

MegaFon utilizes a GSM 900/1800 network. The operator in the Moscow region is Sonic Duo, of which Sonera owns 35% and Central Telegraph Mobile 65%. In Northwest Russia, the operator is Northwest GSM. In addition, MegaFon operates in the Northern Caucasus, Po-

volzhie, Mordovia and Kirov regions. In the beginning of 2002, Megafon had one million subscribers. The total population in the company's licensed region is 122 million inhabitants, i.e. 80% of Russia's population.

Sonera offers network services, as well. Its subsidiary, Sonera Carrier Networks, was the first network operator to build a broadband data transmission network based on DWDM technology[5] in Russia. The company's network is connecting Moscow to St. Petersburg, and goes farther, to Lappeenranta. This explains why Finland is the broadest data-transfer link from Russia to Europe. DWDM technology multiplies capacity, since the parallel bands enable simultaneous services. In addition, transmission speed extensions can be carried out at a lower cost than at present.

Another Finnish company offering data-transfer links in Russia, and from Russia to Finland, is Railtelia, whose optical cable network following the railroad network will be connected to the network of the Russian company TransTeleCom in 2002.

TransTeleCom's network follows the Russian railroad network and is the first and only state-wide optical fiber network. The length of the cable network of the company is 45,000 km. It covers 77 of Russia's 89 administrative regions and is able to serve 90% of the population in Russia. TransTeleCom will establish similar links to China, Kazakhstan, Poland, Estonia and Latvia.

Nokia has supplied telecommunication network equipment and programs to the main operators in Russia, such as Northwest GSM, the company that pioneered GSM operations as early as 1994, and later to VimpelCom, and lastly to MegaFon. Nokia also has a strong position in the data terminal equipment (DTE) market. So far, the Russian market is too small for starting equipment production. State investments in technology development, and possible actions to develop a mobile phone standard that would cover remote areas, make Russia interesting in the longer term.

Elcoteq founded an electronics factory in 1997, as a project, in contract manufacturing in St. Petersburg. At present, the factory employs 150 people. Over time, production efficiency and quality have risen to international levels. Encouraged by this, the management of Elcoteq has discussed the possibility of building a new electronics factory in St. Petersburg with the St. Petersburg administration and authorities. Problems related to customs and logistics have so far prevented the plan from moving forward.

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[5] Dense Wavelength Division Multiplexing.

The software business is the third interesting area in St. Petersburg. Even now, companies in St. Petersburg subcontract out to several Finnish software companies. For example, the Finnish company Atbusiness, employing 200 people in Finland and supplying information systems for retail stores, mainly in Germany, employs 50 programmers in St. Petersburg. In addition to subcontracting, the "St. Petersburg Programming School" is the nearest potential source of high-quality IT labor for Finnish ICT companies. Employing them is, however, still problematic, due to the complicated work-permit procedure.

The Energy Cluster

Finland imports a large amount of energy raw materials and energy from Russia. The imports of energy raw materials consist of gas, crude oil, oil products, coal and nuclear fuel. Imported timber is also partly used for energy production in forest industry processes. In addition, electricity is imported. The Russian producers of energy and energy raw materials are important to Finland and its industry, whose production is relatively energy-intensive.

Oil imports were of great importance in the Soviet period. A great deal of crude oil was imported from the Soviet Union. Changes in oil prices induced significant fluctuations in the value of sales. Annual volumes of exports and imports were held at a constant level, due to a system of bilateral clearing trade, i.e. barter transactions in which money did not cross the borders of the countries. Therefore, the increase in the price of imported oil led to large export orders in other lines of business in order to keep trade in balance.

The only company in Finland that refined Russian oil was Neste, which is now a part of Fortum. The competitiveness of Fortum as an oil refining company is partly based on the development of refining techniques. As the sulfur content of Russian oil is higher than average, Fortum was forced to develop desulfurization technologies. The company has successfully used this know-how in production of fuels with low sulfur content.

Fortum also participates in oil exploration in Northwest Russia. It was one of the first companies to start evaluations of large underdeveloped oil and gas fields in Northwest Russia. Together with KomiTEK, which is a subsidiary of Lukoil, Fortum will invest a total of $360 million ($180 million each) over three years in the South Shapkino field in the Timan Pechora area. The total oil reserves of the area amount to 23 million metric tons. Construction is planned for the period 2001 – 2004. Production is expected to begin in 2003, and reach a maximum volume of 2.6 million metric tons of crude oil annually. The project also involves build-

ing a new 100-km long oil pipeline. Part of the production can be used as a feedstock at Fortum's Porvoo refinery. Fortum has built a terminal in St. Petersburg for oil imports. Exporting oil in the future will require a harbour entrance.

Fortum sells fuel through the Neste retail network in St. Petersburg. The first Neste gasoline station was opened in 1991. Today there are 19 manned full-service stations, 6 unmanned automated A24-stations and 1 automated D-24 station for heavy traffic. The newest stations are mainly unmanned and all stations are open 24 hours a day. With its unmanned stations, Fortum is a pioneer in Russia. Fortum also has a leading network of unmanned gasoline stations in the Baltic countries and Poland. The competitiveness of Neste stations is based on the high standard of their products and services and on early entry in the North-West Russian and Baltic markets.

Natural gas is imported to Finland only from Russia. A Gas supply contract with the USSR and Finland was agreed in 1971 and gas deliveries to Finland started in 1974 after the construction of the gas pipeline from Leningrad to south-east Finland via Imatra. Today the Finnish gas company Gasum handles gas imports, pipeline operation & maintenance and gas retailing in Finland. Gas is delivered and sold by the Russian company Gazprom and its sister company Gazexport. Gasum is owned by Fortum (25%), Gazprom (25%), the Finnish government (24%), the German company Ruhrgas (20%), and three leading Finnish forest industry companies (total 6%).

In 2001, the consumption of natural gas in Finland amounted to 4.3 billion cubic meters (equivalent to 43.3 TWh), which is 11.3% of primary energy consumption in Finland. Industry remained the largest consumer of natural gas in Finland, accounting for 49 per cent of the imported natural gas. Municipal district heating companies consumed 47 per cent of the natural gas. The natural gas market is estimated to grow in the future assuming that the network expansions to the Turku region and western Finland will be found feasible and carried out.

Since Finland imports gas only from the Russian gas monopoly Gazprom, no gas-to-gas competition exists at the moment. The gas purchase and selling prices are linked with the competing fuels in the market. Multi-fuel solutions in power stations and industry, and competition in the open electricity market in Finland, will ensure that market prices of gas remain competitive In other words, if the price of gas increases too much, industry and the power stations will switch to other fuels. In addition, the companies can buy electricity directly from the electricity market.

Gazprom and its western partners are studying the feasibility of a gas pipeline from the Barents Sea to the Central European market. As an investment, the pipeline project would cost EUR 3 - 5 bln. Carrying out such a large-scale project will require international financing and cooperation.

If the gas pipeline from the Stockmann field in the Barents Sea is built via Finland or the Baltic Sea, it will be possible to connect Finland to the pan-European gas network. This would open the Finnish grid and gas market to the open competition.

IVO, which is now part of Fortum, began to import electricity from Russia as early as the 1960s. In addition to Fortum now also PVO and Vantaa Energy and American Sempra import electricity from Russia. Fortum and the Russian electricity export company Technopromexport have agreed that Fortum will have an import capacity of 300 megawatts from Russia at its disposal during the years 2001 – 2007. At least 1.6 TWh of energy will be imported each year. PVO has made an import agreement with the world's largest electricity supplier, RAO Unified Energy Systems (UES) of Russia. From the year 2001 to 2004, PVO has an import capacity of 400 megawatts at its disposal, which corresponds to the production of a large coal-fired power plant, i.e. 2.7 TWh a year. Sempra is importing 150 MW and Vantaa Energy 50 MW in a year.

The nature of electricity imports has changed significantly during the last ten years. Earlier, electricity was imported as a basic source of energy, which competed with Finnish nuclear energy. The opening of the Nordic electricity market has changed the role of electricity imported from Russia. Now, electricity imported from Russia is traded as market electricity. The volume of imports can vary according to the market situation, and the pricing structure also reflects the significance of the exchange price in the Nordic markets as a general price reference. It is obvious that in the future, Russian companies will also operate in the Nordic energy market directly.

At the moment, the Russian company RAO UES and the Finnish national grid operator Fingrid are preparing a pre-feasibility study on increasing the electricity transfer capacity between Finland and Russia. Russia also plans to build new transfer capacity to the Baltic countries and towards Central Europe. Finnish companies are interested in supplying technology for building these networks.

So far, the Finnish energy companies have not operated actively in power generation in Russia. Fortum, however, has purchased a 7-percent share of Lenenergo capital stock.

Finland is, and will continue to be, a net importer of energy and energy raw materials from Russia. In technology, the situation is probably the opposite. Even now Finland exports diesel- and gas-powered power stations and boiler power stations to Russia. For example Wärtsilä supplied 170 megawatts of power station capacity to Russia during the years 1992 - 2002. Power production destinations outside the electricity network, projects in distributed energy production and energy production in industrial processes (e.g., bio-energy in the forest industry) comprise the strengths of the Finns in Russia. Another example is the flash smelting technology developed by Outokumpu, which is the leading technology in the world to produce copper and nickel matte from concentrate. Electric motors, too, have been exported to Russia for use in industry. When the prices of energy raw materials increase, the exports of energy saving technology, such as frequency converters, grow as well.

St. Petersburg is the most important center of energy technology production, research, product development and education in Russia. In the long run, it can be anticipated that Finnish companies will utilize the know-how available in St. Petersburg in their product development, for instance. The Russian companies will also be used for local subcontracting. For example, it is profitable to produce some of the boiler components near the place of installation. In addition, it must be taken into account that the energy technology companies in St. Petersburg have supplied an enormous number of devices, both to Russia and to many developing countries. Very often, entire power plants were supplied as a serial production. This device base requires maintenance. Even during upgrades, power producers often have to abide by old standards or they have to buy from the Russian producers for financial reasons. So, in fact the most valuable asset of the producers in St. Petersburg are their products.

So far, the biggest Finnish-driven engineering projects have been the Russkij Diesel factory, which was built according to plans by Wärtsilä in the Soviet period, and, in power generation, the Northwest Power Plant in St. Petersburg, which was built under the supervision of IVO Power Engineering. The diesel motor factory had no chance to operate well, as the demand for diesel motors has been very low since the formation of the Russian Federation. The first unit of 450 mw of the Northwest Power Plant is in operation, but so far it is used only for electricity generation, although from the start it was meant for combined heat and power generation.

Cooperation between the Finnish and Northwest Russia energy clusters would be of both national and international importance. Finland and St. Petersburg are both centers of energy technology production. When energy prices in Russia go up, producers in Finland and in St. Petersburg are

in a key position to supply new and more efficient technologies for energy generation, transfer and distribution, as well as for energy utilization. Renewing Russian power generation would enable a significant increase in energy exports to Europe and would also maintain the competitiveness of the rest of the export industry.

Finnish energy technology companies have considerable market shares in the world market. Therefore, cooperation in production would open up export markets in other countries for the Russian producers. Similarly, Russia could be a foothold for Finnish companies in their exports to the countries of the former Soviet Union and other countries where Russian energy technology was formerly supplied. The R&D potential in St. Petersburg could strengthen the common R&D in the future.

2.4 Conclusions and Prospects for Cooperation

Finnish and Russian companies do not compete with each other, but complement each other through their bilateral trade. Bilateral trade helps both of them in the export markets of third countries.

Russian exports to Finland consist of energy and energy raw materials (e.g., oil, natural gas, and coal) and other raw materials such as timber, metals, scrap metal and basic chemicals. These are necessary inputs in the manufacture of Finnish export products.

Finland exports technology to Russia for use in its forest, mining, and metals industries, power generation, and telecom operations. When investment in Russia really begins to take off, the country will need much more production technology in these fields. This technology would improve the competitiveness of Russian exporters and increase overall efficiency.

In addition to production equipment, sales of other successful Finnish products, such as paper, mobile telephones and construction materials, have increased considerably in Russia. This is the result of Russia's ongoing integration with the world economy, where certain commodities are bought from the most competitive producers. This is a significant change compared to the situation in the early 1990s, when Finland also exported very exotic products to Russia[6]. Russian consumption of many

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[6] In 1994, for instance, Finland was the second largest banana exporter to Russia in the OECD.

goods, for example paper and mobile telephones, is still modest, which means that the market and growth potential of these exports is still high.

Russia is also an important market for less competitive Finnish industries, for example the food industry. Russia and the Baltic countries form an extended home market and a promising area to locate production. The internationalization of the brewing industry is a good example of this.

Trade between Finland and Russia could be significantly higher. According to theoretical calculations, Russia's share of Finnish exports and imports could reach that of Germany. The share of Germany in Finnish exports was 12.4 per cent, and in imports 14.5 per cent, in 2001. Russia's share of Finnish exports amounted to 5.9 per cent and of imports to 9.5 per cent. The growth potential of Finnish exports to Russia is promising as long as that economy continues to grow and the standard of living increases. It may be more difficult to increase exports from Russia to Finland, since the product range is relatively limited, consisting mainly of raw materials and energy. It is necessary to develop new products and improve the quality of existing ones. Another alternative could emerge through structural changes in trade.

Signs of the restructuring of trade are already visible. For example, Russian entrepreneurs have invested in downstream operations in the Finnish timber industry. Finnish companies have started to subcontract out programming, electronic components, clothes, etc. to Russian firms, or have begun manufacturing operations in their own Russian subsidiaries. A new type of over-the-border production network has started to form, which significantly increases over-the-border trade between the companies and within the network. Trade between Finland and Russia could grow considerably through this channel.

Another source of growth could be strategic cooperation and alliances between Finnish and Russian companies. This has already become a practice in the metal industry. Rautaruukki buys raw materials and semi products from Severstal, and both companies also cooperate in developing the quality of raw materials as well as production process technology. Outokumpu is using its technology and know-how to modernize Norilsk Nickel. This kind of cooperation could take place in the forest industry, and in power generation.

The third important source of growth for trade and economic cooperation could be direct investments. At the moment, the strongest pressure to invest can be found in the forest industry, and Finnish forest companies are ready to make new, large-scale investments. In reality, however, many barriers to investment (see further) have prevented these

investments from taking place. Finnish investment activity could support growth in Finnish-Russian intra-industry trade. Intra-industry trade could consist of, for example, highly processed products used in the mechanical forest industry and in carpentry, and printing papers (paper for newspapers, magazines and copying).

What are the preconditions for growth in economic cooperation and integration between Finland and Russia? There are many factors that can influence these developments.

Legislation has developed significantly. A reform aimed at regulating land ownership was recently adopted in Russia. This law permits private ownership of land (ownership of land for agricultural purposes is prohibited to foreigners and Russians living abroad). Many other laws have not been properly elaborated and make for faulty and uneven application in different parts of the Russian Federation. Some laws and regulations are defective and even invite abuse, for example the bankruptcy and insolvency law. If a foreign company is involved, the court is sometimes biased. Obviously, there is still a long way to go in developing and improving Russian legislation that would provide stability and security of investments. An important means of protecting foreign companies is through proper investment protection agreements. The basic principle in investment protection agreements is simple - foreign companies must be treated the same way as domestic companies, in particular by the authorities. These common rules-of-the-game should also be followed in relations between public institutions and companies. The fact that a company is owned by foreigners must not be a pretext for higher charges for electricity, water, transportation, telecommunications, etc. In addition, the agreement defines the rights of severance from the investments and free repatriation of profits.

The negotiations between Finland and Russia in spring 2002 resulted in a good draft agreement, which would be a good basis for agreements between Russia and other countries, as well, and which would advance Russia's WTO membership. In late spring, however, Russia demanded changes to the agreement. These changes would have significantly increased the number of industrial branches exempt from the agreement. Many Finnish companies consider the investment protection agreement a prerequisite for making large investments. The forest industry in particular has invested considerably less than it could do potentially.

Many investments face practical problems. Large-scale sawmill and pulp-mill investments require large timber supplies near the mill, or at least the availability of timber at reasonable prices and transportation costs. The means to increase the efficiency of timber supply are many,

starting from improving forest reserves (forestry), utilizing harvesting opportunities more efficiently (for example in building forest tracks), and, finally, introducing new and better harvesting regulations (a so-called concession system)[7].

The smooth functioning of the infrastructure is important. Compared to the general level in Russia, the communications network in Northwest Russia is rather dense and functions well. At the moment, Russia is actively enlarging its harbor capacity to the Baltic Sea, and there have been investments in the traffic communication system between Finland and Russia (such as roads to St. Petersburg, border crossing points, and the Salla railroad). From the point of view of export-oriented companies, however, it is important to compare the communications network with that of the Nordic countries or Canada. Thus, the importance of the infrastructure in the locations of mills would be emphasized. Other factors include the service level and fees charged by transportation companies and monopolies. Would, for example, free competition in the railroad, water and air services increase cost efficiency and raise the level of services?

The importance of the data communications infrastructure is growing. It becomes especially important in remote manufacturing districts, where it is not feasible to maintain experts, whose services are not in continual demand. In addition, many experts do not want to settle permanently in remote regions. The importance of data communications grows in everyday operations as well, such as order handling, invoicing, stock management, money transactions, control of industrial processes, etc. Russia faces a great deal of work ahead in building an optimal, functioning data communications system for regions where it is profitable to do business[8], because of their natural resources.

Finland and Russia share common interests in developing the infrastructure of Northwest Russia:

- Finland is and will be the transit traffic hub for certain products exported and imported by Russia.
- As an EU country, Finland can contribute to the development of traffic and transportation networks between the EU and Russia.

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[7] For more, see the forthcoming study of Boltramovich, Efremov and Dudarev: "Competitiveness Analysis of the Northwest Russian Forest Cluster".

[8] For further information on the current data communication networks of Russia, see the research report of Averin and Dudarev: "Competitiveness Analysis of the Northwest Russian ICT Cluster".

- It is in the interests of Finnish companies to invest in Northwest Russia. Developing traffic and data communications networks would considerably improve the operating environment.
- Finnish companies have much to offer in terms of technology, and they are willing to participate in building and operating the infrastructure.

A significant stage in the integration of the Finnish and Northwest Russian economies is the transfer of know-how and technology, the utilization one another's research, and cooperation in product development. However, there is presently very little cooperation in these areas, with the exception of programming, in which Finnish companies frequently subcontract out.

St. Petersburg plays a leading role in Northwest Russia in initiating this kind of cooperation, since all major universities, research institutes and technology producers are located there. In some fields these institutions are at the center of all scientific development being carried out in Russia. From Finland's perspective, Finnish producers of energy technology, ICT, and metallurgy (e.g., in the field of materials techniques) could benefit from the academic education and scientific research of St. Petersburg.

In technological development, as well, Finland and St. Petersburg clearly complement one another. St. Petersburg is more oriented toward basic research. There was no need for investing in marketing and exploring customers' needs in the Soviet period. Due to a limited number of resources, scientific research in Finland is well applied and supports the R&D of companies. Most product development is carried out by companies and is primarily oriented toward increasing production efficiency and developing new products based on customer needs.

In this situation, the exchange of information, common research projects, and cooperation in education can significantly improve prospects for common development. These factors would contribute to the utilization of St. Petersburg's R&D potential by Finnish companies and would allow for the transfer of Finnish technology to Russia, as well as helping to promote solutions optimal for Russian conditions and existing technology. Sooner or later, Finnish companies will of course need highly educated personnel to market their products. In addition to sales, an increasing number of technical personnel will be needed for design, tailored solutions, process building, use and maintenance.

Northwest Russia's Industries and their Agglomerations

In Chapters 3 to 9, we will look at five important clusters of Northwest Russia, which form the economic backbone of the region. These clusters are the forest, metal, energy, food and ICT clusters. We will also become familiar with the construction material production and transport sectors.

The five clusters are leaders in the regional economy in volumes of production output and/or in rates of growth. Their pattern and speed of development will largely determine the prospects for economic integration and cooperation in Northwest Russia. Among these clusters, the first four are already run by internationally competitive producers and associated networks of related and supporting companies. The ICT sector is the most rapidly developing sector, and has excellent growth prospects. They are, thus, the most interesting and important for a regional economic analysis.

These clusters are important to the Finnish economy, as well. In these fields, over-the-border integration will inevitably grow if institutional, and other factors affecting the business environment, will favor such development. Further development of all the aforementioned clusters will create a wide range of potential synergies for economic and business integration between Finland and Russia.

The construction materials cluster, despite availability of substantial natural resources in the region, is rather underdeveloped. Nevertheless, the development of this cluster, as well as that of transportation, is essential for the sustainable growth of the five main clusters. An analysis of the construction materials and transportation clusters are therefore included in the present study, as well.

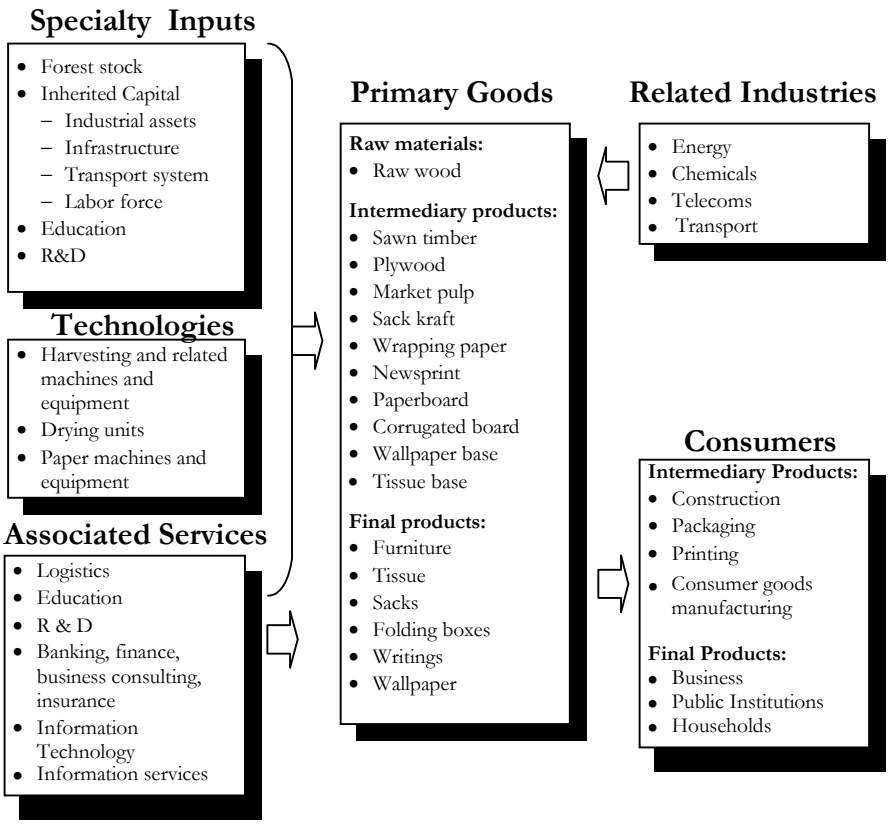
3 The Forest Cluster

Description of the Cluster

The forest industry, along with metallurgy and machine building, is historically one of the leading industries of the Northwest. At present its, share in the total industrial production of the Northwest Federal District amounts to 11.5% of the total. This industry plays a key role in the majority of the regional economies of the Northwest.

About 11% of the Russian forest stock, or 54% of the forest stock of the European part of Russia, falls within the Northwest area. The companies of the region produce 38% of industrial wood, 29% of sawn timber, 38% of plywood, 47% of market pulp and 58% of paper (2000 data) in Russia.

Figure 3.1 Structure of the Forest Cluster.



The list of primary goods represents the low level of applied technologies in the cluster, as regards their relative weight in terms of production volume and growth. At present, the share of goods with high added value is relatively small, and the range of products offered by the local manufacturers in this category is limited and poor. The only products with relatively high added value that have significant share in the forest industry output of the Northwest are pulp and low-grade paper . Unfortunately, pulp has become a highly standardized product that in many respects is similar to the bulk raw material available on the world market. The pulp market does not, therefore, leave sufficient room for differentiation and, thus, does not allow to sustain higher rents if the cost advantage is not sustained. However, the relatively cheap and plentiful resources, as well as the low cost of labor in the Northwest, create substantial opportunities for cost advantage for domestic pulp and paper manufacturers for some time.

The most important specialty inputs in this cluster are represented by the rich forest stock (more than 50% is coniferous) and the labor force, which has been traditionally trained in specialized educational institutions. The largest universities and training centers are located in St. Petersburg, Petrozavodsk, and Arkhangelsk.

At present, the applied technologies and the operating equipment, i.e. the industrial assets, are for the most part worn-out and outdated, and require significant modernization. The localized user-producer relations between forest companies and equipment manufacturers are one of the essential factors underlying the sustainability of the competitive position of the Finnish forest cluster. Unfortunately, the equipment producers of the Northwest, which specialize mainly in manufacturing of harvesting and papermaking machinery[9], are unable to offer competitive solutions for the local user and cannot claim to have established a sophisticated cooperative relationship with them. The major performers on the market purchase mainly imported equipment. The majority of companies still cannot raise funds for purchasing new equipment abroad, however. Therefore, many of them either buy second-hand imported equipment and are satisfied with the older technologies and processes, or use low-priced domestically manufacture machinery that usually offers even older and less efficient technologies. There is a growing interest and cooperation between the Northwest technology companies and international

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[9] The largest manufacturers of harvesting machines, Onezhski Tractor Plant, and of pulp-and-paper mill equipment, PetrozavodskMash, are both located in the city of Petrozavodsk, the Republic of Karelia.

leaders, such as Metso Paper, which might in the long term result in advantages for the Russian forest technology companies, as well, by providing customized and efficient solutions.

Among the associated services that support cluster development, logistics are the most vital. The companies of the Northwest have the advantage of a relatively well-developed transport infrastructure and proximity to the main consumer markets. Unfortunately, the density of the infrastructure varies greatly from region to region. It is, however, substantially higher than the Russian average[10]. Railroad and water transport provide the largest volumes of freight transportation, as the quality of the highways in the region does not meet a reasonable and efficient standard. Further development of the cluster is largely constrained by the existing gaps and deficiencies in the transport, communications and energy supply infrastructure.

The role of financial, informational and consulting services has increased significantly in the cluster during recent years. Companies pay more attention to audit, business planning and strategy, information systems, fund raising and PR.

Power production represents the main supporting industry in the cluster. At present, the industrial use of power in the cluster is grossly inefficient. However, rapidly increasing tariffs for power are likely to decrease the cost advantage of local companies and could motivate them to put aside additional resources to improve the utilization of energy.

Another essential industry that could help generate sustainable rents in the forest industry is the production of chemicals. Domestic chemicals production has been substantially reduced due to the decline in the forest industry that took place in the 1990s. The product range of domestic chemical companies does not meet the changing demand of the manufacturers of forest products and must be extended and improved in order to meet modern demands for quality. This is absolutely necessary if the local manufacturers of forest products are to be competitive and generate higher rents. At present, the regional pulp-and-paper companies depend greatly on imported chemicals, which leads to an increase in the costs of their products due to high transportation costs.

Domestic consumers are becoming more sophisticated today than they were in the 1990s. A rapidly growing demand for quality products leads to an increase in imports, and will encourage foreign and domestic investments in import substitution. Successful foreign exporters to Russia have witnessed their exports shrinking due to the

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[10] See also Chapter 3.8.

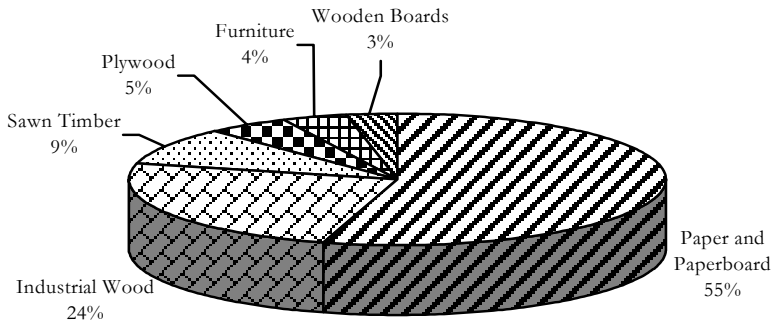
growing domestic competition. The door of opportunity is still open for foreign players, and Finnish companies in particular, due to relatively large exports to Russia and their knowledge of the country.

Cluster Mapping

The Domestic Market

During 1995-1999, sales in the forest industry of the Northwest fell in real terms by 2%, and in monetary terms by 52%, due to the devaluation of the national currency. A stable growth in sales has been evident since 1999 in monetary terms (and in real terms since 1998).

Figure 3.2 The Structure of Sales in the Main Product Groups of the Northwest Forest Industry.



Source: Association of Furniture and Woodworking Enterprises of Russia (2001)

In the year 2000, the total production volumes of the Northwest forest industries exceeded EUR 2.7 billion, while about 80% of total sales has fallen within the paper, paperboard and industrial wood industries.

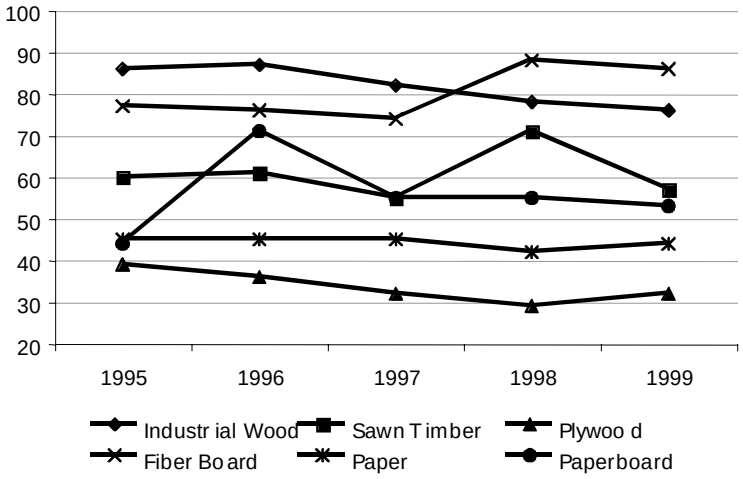
Industrial Wood and Sawn Timber

During 1995-1999, domestic sales of industrial wood varied from 18 to 24 million m^3 (22 million m^3 in 1999). As for sawn timber, the domestic sales fluctuated in the range of 2.35-3.30 million m^3 (2.74 million m^3 in 1999). The dynamics of industrial wood demand are closely connected with the general trends within the forest industry, which is the main consumer of industrial wood.

Plywood, Particleboard and Fiberboard

The demand for plywood in the region increased from 99,000 m^3 in 1995 to 153,000 m^3 in 1999. The domestic market consumes only one third of the total production, while the rest is exported. On the other hand, nearly all the particleboard produced in the region (about 98% in 1999) is sold within Russia. Particleboard production in the region experienced growth during 1996-1999 - from 200,000 to 400,000 m^3.

Figure 3.3 The Share of the Domestic Market in Total Sales of the Northwest Forest Industry, %.



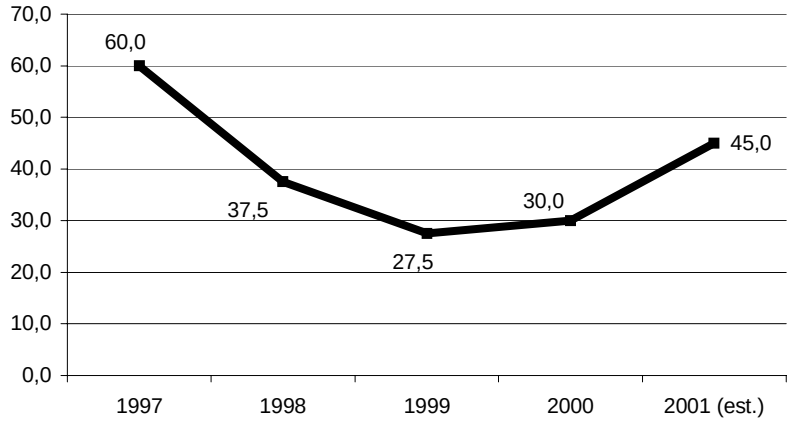
Source: State Committee for Statistics (Goskomstat) of the Republic of Komi (2000), "The forestry sector of the regions of the Northwest Federal District of Russia and Kirovsk Region"; authors' calculations

Fiberboard production also increased during this period from 32 million m^2 to 44 million m^2. The growth in board production has contributed to the development of the furniture industry. However, there is a growing number of local consumers demanding a higher quality board, and, as a result, a significant part of this board is imported. The higher quality MDF-board, 75% of which is imported, is in highest demand in the region. Demand for various types of board quality shifts to higher quality grades as domestic manufacturing of final products develops (primarily furniture producers), driven by the growth of demand, and the sophistication and selectivity of the local consumers.

Furniture

The domestic demand for furniture strongly correlates with the income level of the population and overall business activity in the country. In the year 1997, the Russian furniture-market demand exceeded $2.5 billion. The crisis of August 1998, resulted in a reduction of market demand by more than four times, but since the year 1999, market demand has increased again, and reached $790 million in 2000. Similar trends were also observed in relation to the share of foreign furniture on the Russian market:

Figure 3.4 Share of the Foreign Furniture on the Russian Market in 1997 - 2001, %.



Source: State Customs Committee of Russia (2001)

Paper and Paperboard

The domestic consumption of paper increased substantially. from 605,000 metric tons in 1996, to 744,000 metric tons in 1999. The share of imports for many products with high added value (office paper, labels, magazine paper, tissue etc.) continues to be high. In near future, the steady domestic demand for all kinds of paper is likely to increase due to growth of advertising activity, and publishing and document circulation.

The growing domestic market for pulp-and-paper products during recent years has fueled domestic and foreign investments in this industry. In 1999, new production lines for office paper manufacturing were introduced at two companies, Svetogorsk PPM (controlled by International Paper) and Syktyvkarski LPK (controlled by Frantschach AG

and Neusiedler, both owned by Mondi, owned in turn by Anglo-American Plc.). By 2001, these companies occupied the market niche that was dominated earlier by imported products.

The increase in retail and wholesale turnover and domestic manufacturing in Russia has led to rapid growth in the domestic demand for packaging board. During 1995-1999, the consumption of this product increased by 70% (from 258,000 metric tons to 455,000 metric tons). According to experts' estimates, the demand for packaging materials will be growing at higher rates than domestic production in the near future.

The International Market

Taking into account the significant share of the Northwest in the total production of forest-related products in Russia, one can extrapolate the results of the Russian foreign trade analysis to the Northwest forest cluster. The following table shows that Russia has a positive trade balance with OECD countries in forest-related products.

Table 3.1 Indices of Foreign Trade of Russia with OECD Countries by Forest Industry Products in 1999.

Index	1998	1999
Total Exports, million US dollars	2,715	3,414
Share in total imports of OECD countries	1.47%	1.52%
Total Imports, million US dollars	2,112	1,413
Share in total exports of OECD countries	1.16%	0.67%
Trade balance, million US dollars	603	2,001

Source: OECD, International Trade by Commodities Statistics ITCS (1999)

Russian exports of forest-related products occupy a significant share of OECD markets[11]. A more detailed analysis shows the competitive edge[12] of Russian forest-related products on the OECD markets.

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[11] Russian exports of forest-related products to OECD countries equaled 1.47% of the total OECD imports of these products, while the Russian average share accounted for 1.09% in 1999.

[12] A commodity group is considered as competitive if the share of its export on the corresponding OECD market is higher than the share of the total Russian exports in the total imports of OECD countries, which accounted for 1.09% in 1999, and the trade balance is positive.

Table 3.2 The Competitiveness of Russian Forest-Related Products, HS, 6-digit level, 1999 data.

HS #	Item	Share in OECD imports	OECD imports, million US dollars	Exports from Russia, million US dollars	Trade balance, million US dollars
440320	Logs, poles, coniferous	27.89%	4,279	1,189	1,189
440399	Logs, non-coniferous	15.22%	2,087	317.7	317.6
441212	Plywood, at least 1 outer ply of non-coniferous wood (ply's <6 mm)	8.42%	1,865	157	156
441219	Plywood, at least 1 outer ply of coniferous wood (ply's <6 mm)	3.69%	1,200	44.2	44
480100	Newsprint, in rolls or sheets	3.38%	8,146	275	274.7
470321	Chemical wood pulp, soda or sulfate, coniferous, semi-bleached or bleached	3.28%	6,847	224.3	208.6
480411	Paper, kraft, rolls or sheets, >150g/m2, <225 g/m2, unbleached, uncoated	3.24%	1,814	58.6	56.2
440710	Lumber, coniferous (softwood) 6 mm and thicker	3.17%	16,490	523	521
470329	Chemical wood pulp, soda/sulfate, non-coniferous, semi-bleached /bleached	2.88%	4,920	141.7	141.7

Source: OECD, International Trade by Commodities Statistics ITCS (1999)

A detailed analysis of the competitive product groups shows that in Russia, the forest sector is competitive on the international market only in raw wood and low value-added products. As we see from the analysis of import data in Finland (Table 2.2 in Chapter 2), Finnish forestry companies represent the largest market for the raw wood and intermediary products manufactured in the Northwest. In some groups of products, the importance of Russian supplies is so high that they have acquired strategic importance for the leading Finnish forestry companies. This fact also points to the creation of over-the-border dependencies of such scale that the emergence of an intra-regional cluster of industrial activities becomes evident. Among the most important forest products exported by Russian companies are plywood, newsprint and pulp.

Table 3.3 Potential for Import Substitution, HS, 6-digit level, 1999 data.

HS #	Article	Share in OECD exports	Imports to Russia, million US dollars	OECD exports, million US dollars	Trade balance, million US dollars
940360	Furniture, wooden	2.26%	189	8,401	-178
481920	cartons, boxes and cases, folding, of non-corrugated paper or paperboard	3.62%	105.5	2,918	-105.5
490290	Newspapers, journals and periodicals	1.88%	67	3,572	-66
940340	Kitchen furniture, wooden	2.87%	63.6	2,219	-63.2
481011	Paper, fine, woodfree, in rolls or sheets, </=150 g/m2, clay coated	0.99%	58	5,849	-57.5
481840	Sanitary articles of paper, including sanitary towels & napkins (diapers) for babies	1.37%	53	3,876	-52.9
940350	Bedroom furniture, wooden	1.71%	49.7	2,901	-44
482110	Paper labels of all kinds, printed	2.66%	40	1,489	-40
441820	Doors and doorframes and thresholds, of wood	3.06%	34	1,126	-33.6
940330	Office furniture, wooden	1.90%	33.5	1,767	-31.7

Source: OECD, International Trade by Commodities Statistics ITCS (1999)

Despite their significant production capacity, Russian companies import substantial volumes of forest-related products. Low quality product-oriented technologies from the Soviet period, lack of investment in the past decade, various drawbacks and problems in managing forest companies, and low motivation and responsibility of personnel are among the most frequently mentioned obstacles to manufacturing higher quality products. Trade data analysis[13] reveals a significant potential for import substitution in the sector.

[13] Statistical cluster analysis was used for singling out commodity groups with a significant import substituting potential in the sector. All the 6-digit commodity groups were divided into three clusters by volume of imports into Russia. The first cluster is interpreted as product groups possessing substantial possibilities for creating import-substituting production in Russia. These product groups are presented in the Table "Potential for import substitution."

The data presented above proves that Russia depends greatly on imports of some forest-related products with high added value. The main imported products are wooden furniture and its components, packaging materials, fine paper and printing products. The different customer preferences for some of these groups of products in Russia as compared to customer preferences in the neighboring OECD countries provide opportunity for domestic manufacturing that could combine western skills and the cost advantage of domestic manufacturing.

Import volumes in the outlined product groups are rather high - the annual trade turnover for 11 of the items presented in the table amounts to nearly $1,300 million. Hence, there are substantial opportunities for the manufacture of selected product groups in Russia and cross-border integration.

The Cluster System

History and Evolution

The forest industry is the oldest among industries of the Northwest. The utilization of wood for many purposes has a long history and tradition in Russia. Wood was lumbered to be used as construction material and fuel, as well as for tar distillation. Paper production began in the region in the early 18th century. By the beginning of the 20th century a relatively well developed mechanical wood-processing (primarily, sawn timber production) and pulp-and-paper industry was created in St. Petersburg, and in Arkhangel, Vologda, Novgorod and Pskov provinces.

The main production facilities still operating today were primarily built during the Soviet period. In the 1960s, heavy concentration of industrial production in certain politically selected locations led to the establishment of agglomerations in the Arkhangelsk region (cities of Arkhangelsk and Novodvinsk, Kotlas, Syktyvkar), the Leningrad region, and the Republic of Karelia. The mechanical wood-processing mills were substantially enlarged, modernized harvesting activities were expanded, and a new system of forestry planning was introduced in that period.

By the end of the 1980s, the forest industry had become one of the leading and rapidly developing branches of the regional economy. However, production technologies were inflexible, the assortment poor, the depth of processing was rather low, and the environmental pollution caused by the existed facilities was high.

The period of 1990s was characterized by a sharp decline in production. The production volumes decreased tenfold in some product groups. At the same time, many other negative events took place in the industry, such as disruption of relations between the companies and a rapid reduction of investments in fixed capital, etc.

After the crisis of August 1998, a shift in domestic demand from imports to domestic products and favorable international market price conditions for exports resulted in the rapid growth of domestic production. A large gap between the present and the pre-reform production volumes of forest products still exists, however. A high revenue volatility that could be overseen as a result of the increased exposure to the global spot markets owing to the fact that low quality and unreliable delivery makes nearly impossible for the Russian producers to integrate into more stable just-in-time systems of western business customers and obtain better prices.

Cluster Sub-Sectors

In the Russian Northwest, all the main sub-sectors of the forest cluster are represented. They are:

- Forestry and harvesting,
- Mechanical wood-processing,
- Pulp and paper.

Forestry and Harvesting

Forestry and harvesting provide raw materials for the processing subsectors: mechanical and pulp and paper. In addition, industrial wood is the main export article in this region.

Table 3.4 Production of the Harvesting Industry of the Northwest in 1995-1999, million m^3.

	1995	1996	1997	1998	1999
Timber removal	32.8	27.4	25.9	25.7	31.7
Industrial wood	28.1	23.1	22.0	22.8	28.8
Round wood	25.3	20.9	20.1	20.6	25.9

Source: Goskomstat of the Republic of Komi (2000), "The forestry sector of the regions of the Northwest Federal District of Russia and Kirovsk Region"

The forests of the region are supervised by the state forestry enterprises (*leskhozy*). The main tasks of these organizations are forest care, reforestation, evaluation of forest stock, and determination of annual allowable cut.

In the 1990s, government control over forest usage was substantially reduced. Financing of replanting became insufficient, and numerous violations took place in this field. Monitoring of the forest resources deteriorated and led to a situation in which it was difficult to determine the actual amount of resources available in certain locations.

Figure 3.5 The Largest Harvesting Companies of the Northwest.

Harvesting is carried out primarily by private companies, which are based on privatized assets of the former state-owned harvesting organizations (the so-called *lespromkhozy*). Today, many of these former state harvesting enterprises are divisions of large vertically-integrated companies that have been formed around local mechanical wood-processing and pulp-and-paper companies.

The leading regional manufacturer of machinery for harvesting is the Onezhski Tractor Plant, located in Petrozavodsk, the Republic of Karelia. The transportation and harvesting equipment produced by this company is largely outdated, of low quality, and in many ways inefficient.

Mechanical Wood-Processing

The main products of the regional mechanical wood-processing industry are sawn timber, plywood, particleboard, and fiberboard. There is also

furniture manufacturing, which consumes intermediate products produced by the mechanical wood-processing companies located in the region.

Table 3.5 Production Volumes of the Mechanical Wood-Processing Industry of the Northwest in 1995-1999.

	1995	1996	1997	1998	1999
Sawn Timber, million m^3	5.6	4.4	4.2	3.8	4.8
Plywood, thousand m^3	255.6	265.5	322.8	408.8	513.5
Particleboard, thousand m^3	408.7	204.2	238.9	322.1	404.1
Fiberboard, million m^2	51.3	41.7	53.2	41.8	51.3
Pulp chips, thousand m^3	1,332.3	931.7	928.9	1,011.2	1,436.7
Wooden Railroad Ties, thousand	1,123.9	1,012.7	903	693.2	569.2

Source: Goskomstat of the Republic of Komi (2000), "The forestry sector of the regions of the Northwest Federal District of Russia and Kirovsk Region"

Sawn timber production is concentrated in the Arkhangelsk and Vologda regions, and the Republics of Komi and Karelia. The three largest sawmills in the Northwest, Solombala LDK, Onezhski LDK and Arkhangelski LDK, are located in the Arkhangelsk region and have aggregate turnover of about $70 million.

Plywood and wooden board is produced at mills located in the Arkhangelsk, Vologda, Novgorod, Leningrad regions, as well as in the Republics of Karelia and Komi. There are no obvious leaders so far in this field.

Figure 3.6 The Largest Mechanical Wood-Processing Companies of the Northwest.

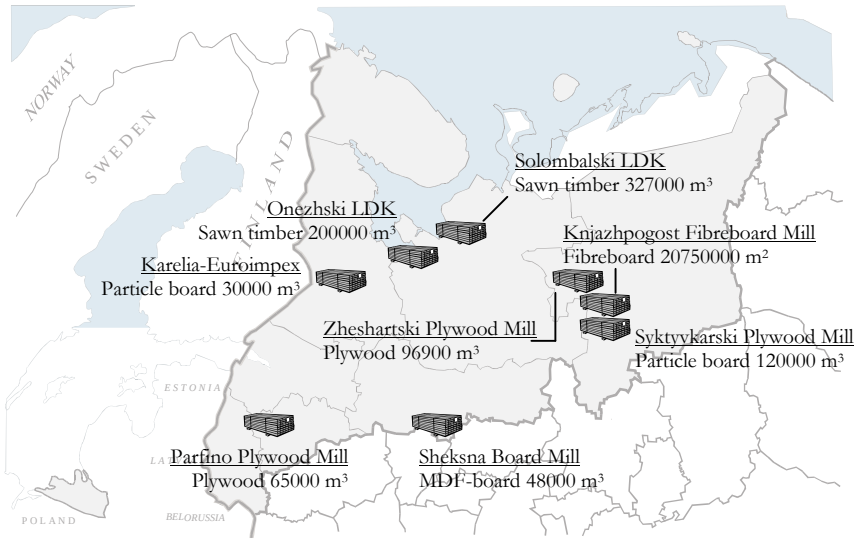
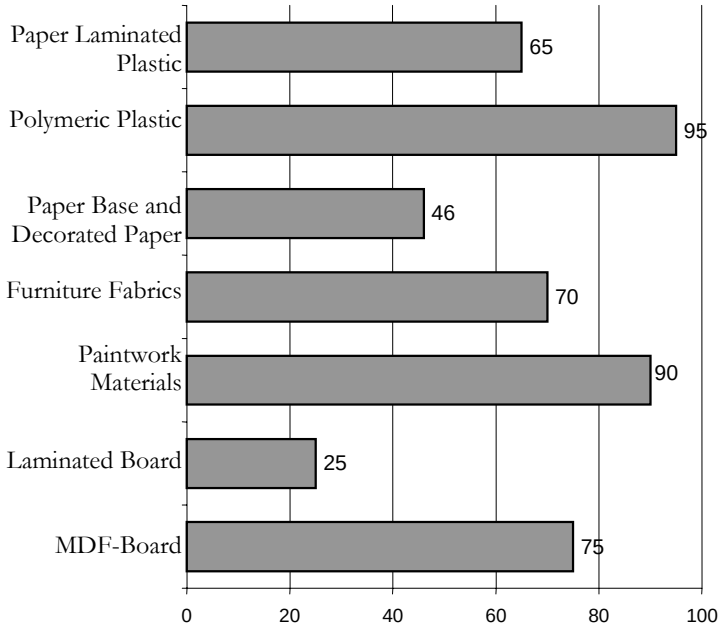


Figure 3.7 The Share of Imported Components in Furniture Production, % of Total Consumption.



Source: "Wood-processing" magazine, #2, 2001

Furniture manufacturing has been rapidly developing in the Northwest since the devaluation of the ruble in August 1998. Since that time, domestic demand has shifted to local products that gained cost advantages. During the period from 1999 to 2000, the annual growth of domestic furniture production reached 30%. In 2000, the overall turnover of regional companies was equal to $90 million, or about 13% of the total Russian market for furniture.

The furniture producers of the Northwest manufacture a wide variety of furniture. The leaders are the SevZapMebel and Pervaya Furniture Factory, both located in St. Petersburg.

In 2000, the share of imported furniture in terms of sales was about 38% (mainly office and high-quality furniture for the home). The share of imported components used by domestic furniture producers is high (see Figure 3.7).

Pulp and Paper

The pulp-and-paper industry is a leader in sales among the forest industries. It provides about 40% of the total exports of forest products.

Table 3.6 Production of the Pulp-and-Paper Industry of the Northwest in 1995-1999.

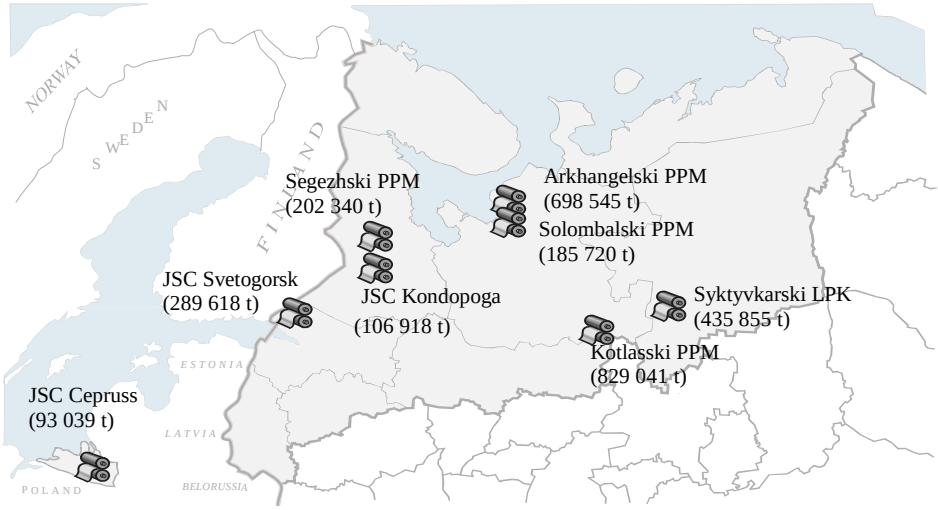
	1995	1996	1997	1998	1999
Pulp, thousand tons	2,432.7	1,799.3	2,129.1	2,104.2	2,659.2
Paper, thousand tons	1,589.1	1,358.3	1,412.3	1,435.9	1,726.4
Paperboard, thousand tons	603.4	463.5	612.5	620.0	862.5

Source: Goskomstat of the Republic of Komi (2000), "The forestry sector of the regions of the Northwest Federal District of Russia and Kirovsk Region"

The mills are located in the Arkhangelsk (3 mills), Leningrad (3 mills), and Vologda (2 mills) regions, the Republic of Karelia (2 mills) and the Republic of Komi (1 mill). Each mill specializes in producing specific pulp-and-paper product groups.

The main export articles in this sub-sector are pulp, newsprint, and corrugated board. The domestic market for pulp-and-paper products, which recovered after decline in the early 1990s, has good prospects for further growth.

Figure 3.8 The Largest Companies of the Pulp-and-Paper Industry of the Northwest*.



* Production of pulp in 2000 is presented in parentheses

Primary Issues and Challenges for the Future

The forest industry of the Northwest represents an established network of forestry and harvesting enterprises. The networks of the wood proc-

essing and pulp-and-paper industries are based on links with procurement companies. Arkhangelsk, the largest forest port in the country, also represents the main export gates, along with St. Petersburg, providing access to international trade networks.

Vertical integration inside the industry is developing in two directions:

- Harvesting → wood processing, and
- Harvesting → pulp-and-paper industry.

The link between the two processing sub-industries (mechanical and chemical) is hardly recognizable. There is very little horizontal cooperation in the development of new products and markets, logistics, etc. due to the great distances of the enterprises from one another, their historically established specializations, regional barriers, and growing transport tariffs.

The industry's competitiveness on international markets is cost-based, and determined, in the first place, by vast and cheap forest resources, relatively low (in comparison with Western Europe) energy and transport costs, and the low cost of labor. The existing equipment and the quality of labor the force allows only for the manufacturing of cost-competitive products with low added value. Due to low prices and the proximity of the manufacturers to the markets of Western Europe, these products and industrial wood are competitive on international markets. The domestic market for pulp-and-paper products is rather large, and requirements for quality and product range are much lower than on foreign markets. Therefore, there are also domestically, not internationally competitive producers.

At present, the industry is characterized by low transparency. A second wave of property re-distribution is taking place at the moment. It is accompanied by capital flight from the largest enterprises of the forest industry. Another significant problem is the social burden that the large forestry companies are bearing today due to the fact that whole towns grew up around them. Thus, under the present circumstances and until the further pattern of development of the Russian forest industries becomes visible, it is hard to envision any significant investments in the development of the industry. Significant changes in government economic policy are required to facilitate the introduction of modern technologies and the manufacturing of products with higher value added. Sound improvements in infrastructure are also in order.

The future of the forest industries requires us to find an answers and solutions to the following questions and challenges:

1. What are the prospects for the formulation of a sound and coordinated industrial policy in this sector? Is there a chance that industrial policy will be coordinated on the federal and regional levels, and between these levels, or that more regional involvement will be necessary to achieve success in the future?
2. How will the development of the infrastructure proceed in the Northwest of Russia in future? Is there a place for focused and coordinated federal and regional effort in infrastructure and education?
3. What are the chances that improvement in law enforcement and development will take place in the years to come?

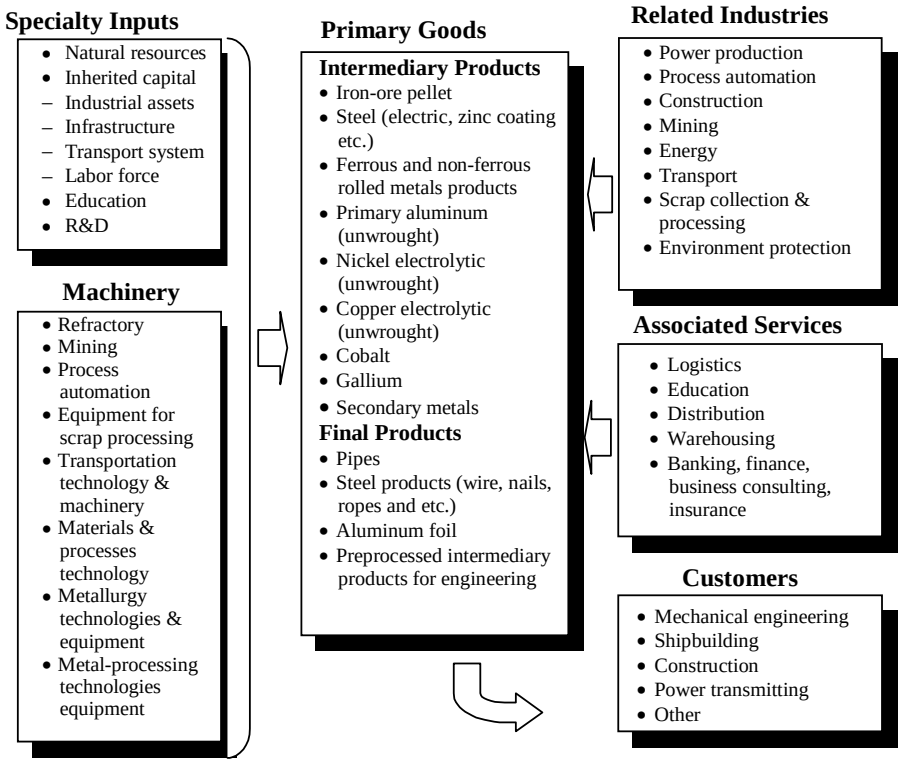
The role of the State in the development of the industry is still insignificant. If there is no clear state industrial policy, the development of the forest industry in the region is likely to be determined, first, by conditions of the domestic and international markets, and, second, by the dynamics of development (consolidation, profitability, efficiency, etc.) of the largest regional players. The achievement of a much higher level of dialog between domestic businesses, foreign investors and government is highly desirable if the country is to develop its long-term export ability. A much more focused policy and commitment is needed from all the parties. There are challenging and difficult times ahead in the forest industries.

4 The Metal and Metalworking Cluster

Description of the Cluster

By the time the reforms started in Russia, the structure of the metallurgy and metalworking cluster in the Northwest had been more or less formed. It was determined by the availability of special inputs (natural resources, inherited capital, education and R&D), a high level of technological integration, established links between educational and research institutions, etc. Metalworking enterprises played a key role in the cluster. Base metals production was largely oriented towards supplying the needs of metalworking and mechanical engineering.

Figure 4.1 The Northwest Metal and Metalworking Cluster Chart.



The transformation of the economic environment in the beginning of the 1990s lead to substantial changes resulting in the dismantling of trade barriers and, consequently, exposure of companies in the region to global competition. This, in turn, resulted in a sharp decrease in production volumes. Regional mechanical engineering was isolated and unprepared (in terms of both technology and management efficiency) for the emerging competition, including the competition in the markets where it previously dominated.

On the other hand, the metallurgy enterprises of the Northwest, which were oriented towards largely standardized primary products characterized by lower costs in comparison with their western competitors, made the most of the new opportunities and took the lead in the cluster, switching from supplying captive customers assigned to them by the state planning system, to exports. These structural changes, both in metallurgy and metalworking shaped the present cluster's industrial activity.

The basis for cluster development still lies in specialized resources concentrated in the region. In this sense, first in order of priority among special inputs are the available raw materials. Metallurgy enterprises were located by the Soviet planning system close to the key production factors, primarily raw materials and energy[14]. A large number of educational and research institutions (some of which are basic research centers in the corresponding industries in Russia), were located in the region as a result of the development of regional industrial complexes beginning in the 1960s. These inherited facilities are still important for product and technology development within the cluster. The availability of inherited industrial assets provides for the current functioning of the cluster. However, technical characteristics of existing industrial assets, such as high depletion and low productivity, decrease the possibility for cost advantages as the time goes by. The geographical proximity of production, educational and research institutions contributed to the reinforcement and development of internal integration (personnel training, joint R&D projects) in this cluster.

Structural changes in the Russian economy weakened or destroyed once established relations of industrial cooperation. The dramatic decrease of the domestic demand has had a great impact on the production and investment activities of the regional metallurgy companies.

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[14] During the construction of Severstal, iron-ore deposits in Murmansk area and in Karelia, as well as the coking coals of Vorkuta area were taken into consideration; Volkhov Aluminum intended to use the alumina of Pikalevo and Boksitogorsk and Volkhov Hydro Energy.

The sharp reduction of state financing negatively affected education and R&D. Meanwhile, as competition grows, the requirements for the quality of the labor force are rising. However, the gap in quality and inflow of new workers that emerged in the 1990s, and the deterioration of the working culture and the prestige of the metallurgy and metalworking industry, resulted in a substantial loss of skills in many companies.

Despite the diversity of products manufactured by the local enterprises, only a small part can be considered as final products. These are, in the first place, the pipes, hardware (wires, nails, cables, etc.), foils, as well as preprocessed intermediary products for engineering. The intermediary products, which dominate in the sales of Russian companies, are unwrought metals (iron-ore pellets, aluminum, copper, cobalt, nickel, etc.), and rolled stock. The small share of final products manufactured in the Northwest can be explained by their lower competitiveness in comparison with pre-processed intermediary products. In fact, the world leaders in metallurgy and metalworking production are oriented primarily toward the manufacturing of final products with high added value (processed products for engineering), which allows for better profitability and market power.

As a result, only a small part of the cluster output is consumed within the region, primarily by machine-building companies, construction, etc. Most of the output is produced as mass, intermediary products for export (on average 50% of industry sales and 65% of some product groups sales), which are processed further somewhere abroad.

Machinery and equipment manufacturing is the weakest component of the cluster. Presently, there are no competitive producers of equipment and machinery for the manufacturers of primary goods in the Northwest. They fall substantially behind their foreign competitors in production technology, R&D, management and marketing. There is delayed demand for renovation of metallurgy and metalworking production in the local markets, however. Knowledge of the market, of the existing standards of equipment installed in the Russian metallurgy and metalworking plants, as well as maintenance contacts with key companies, gives local equipment manufacturers advantages that could lead to the creation of competitive machine-building companies in this industry, at some stage.

Companies in related industries, i.e. in power production, transport and mining, have a strong impact on the cluster's structure and its development. At the moment, the prospects for evolution of cluster depend greatly on the situation in these industries.

Cluster Mapping

The Domestic Market

Metallurgy[15], despite a fall in production volumes[16], remains one of the key industries of the Russian economy. According to results from the year 2000, the share of metallurgy in the total volume of national industrial production was equal to 16.4%. Aggregate sales metallurgy companies amounted to more than RUR 781.1 billion (about $27.8 billion).

Metallurgy companies provided about 17% of Russia's hard currency revenues. Two-thirds of all metallurgy companies have actually formed towns nearby and bear a large social responsibility for the populace.

The enterprises of the Urals provide the largest part of metallurgy production (38.1%). This is largely due to the history of the region's development and to the strategy of the development of the metallurgy industry during the Soviet period. This strategy stipulated that metallurgy and metalworking enterprises be placed in the immediate vicinity of raw materials and large consumers (machine-building plants).

Table 4.1 Russian Metallurgy in 2000.

	Total Metallurgy		Ferrous	Non-ferrous
	Total	Share in Russia, %		
Production, billion US dollars	27.8	16.4	13.1	14.7
Employed, thousand people	1,244	1.7	703.0	541.0
Investment in Fixed Assets, billion US dollars	2.2	5.3	1.2	1.0
Export, billion US dollars	15.0	14.6	6.7	8.3

Source: State Custom Committee, 2000. www.gks.ru. www.ampoc.ru

[15] According to the Russian classification of industries, metallurgy and metalworking are totally different sectors (metalworking being part of machine-building). As it is impossible to select this sub-branch for statistical analysis and its weight is still negligible in the base metal sector, industrial production data is presented and evaluated for metallurgy alone.

[16] In 2000, the production volumes in ferrous and non-ferrous metallurgy were 71.0% and 57.6% respectively, in comparison with the level of 1990.

The enterprises of the Northwest Federal District provide 13.3% of the total metallurgy production in the country. The total share of metallurgy in the District's industrial production is 18.7%. The largest share is occupied by ferrous metallurgy enterprises, providing for 13.1% of industrial production. Non-ferrous metallurgy is less developed here, its contribution in the industrial production is just 5.6%.

Table 4.2 Metallurgy in the Northwest in 2000.

	Output in 2000, RUR million	Share[17] in Industrial Production, %	
		Ferrous Metallurgy	Non-ferrous Metallurgy
St. Petersburg	128,697	1.9	1.2
Vologda Region	91,100	65.6	0.3
Leningrad Region	55,069	8.3	0.2
Republic of Komi	50,746	-	0.1
Murmansk Region	48,114	10.0	38.5
Arkhangelsk Region	38,777	0.1	0.2
Republic of Karelia	24,617	13.6	5.2
Novgorod Region	18,781	5.5	0.1
Kaliningrad Region	14,841	1.4	0.7
Pskov Region	7,731	1.5	0.2

Source: Goskomstat, Statistical Yearbook of Russia, 2000

One must note that metallurgy in the Northwest is regionally specialized. The main centers of mineral extraction are the Republic of Komi (raw materials for ferrous metallurgy), the Murmansk region (for ferrous and non-ferrous metallurgy), and the Leningrad region (for non-ferrous metallurgy). Production facilities oriented towards manufacturing of semi-final and final products are concentrated in the Vologda region (ferrous metallurgy products), the Murmansk and Leningrad regions (non-ferrous metallurgy products), and the city of St. Petersburg (ferrous and non-ferrous metallurgy products).

[17] Information on the contribution of industries to the total volume of industrial production dates from 1999.

The International Market

The products of metallurgy and metalworking enterprises are the second important product group[18] in Russian exports. According to the preliminary information for the year 2000, the share of metals and metal products in the country's exports was 17.1%, while the export[19] volume of the industry in monetary terms amounted to $16.7 billion. The relative weight of non-ferrous metals and products in the export structure was 51%, ferrous metals and their products 41%, and the remainder was exports of non-precious metals and products. At the same time, Russia imports substantial amount of metals and metal products, which are the fourth largest item among Russian imports. In 2000, Russian imports of metal products reached $2.5 billion, which is 8.3% of total imports.

Metallurgy in Russia (including the Northwest, see data in Table 4.3) is export-oriented. In 2000, about 59% of the total output was shipped to consumers located outside the country (in 1999 almost 71% of total metallurgy sales was exports).

Table 4.3 The Share of Exports in the Sales Structure of the Main Metallurgy Enterprises of the Northwest.

Company	Products	Production, thousand tons	Export share, %
Karelski okatysh	iron-ore pellet	6,708	≈30
Severstal	steel	9,547	53
	rolled metal	8,338	
Cherepovets Steel Rolling Mill	metal production	470	25
Severonikel	nickel	33.5	82
	copper	16.4	63
	cobalt	0.4	60
Krasniy Vyborzhets	rolled non-ferrous metal	13.3	30
St. Petersburg Foil Plant	foil	10.4	25

Source: data provided by the mentioned companies

The favorable geographical location of the Northwest metallurgy enterprises (their proximity to raw materials and export markets, rela-

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[18] The first position in the export structure is occupied by fuel and energy products. In 2000, they provided 53.5% of Russian exports.

[19] According to the information of the State Customs Committee (SCC).

tively developed transport system in the region, etc.) provides for an additional cost advantage over enterprises of other regions in Russia (Urals and Siberia).

The main product groups of metallurgy in Russia have a positive trade balance with OECD countries. The share[20] of metals and metal products exports is by far higher than the total share of Russian exports among the OECD imports[21].

Table 4.4 10 Competitive Positions of Russian Enterprises at OECD Market in 1999.

	Russia's share in OECD Export	OECD Export to Russia, thousand US dollars	Total OECD Export, thousand US dollars	Russia's trade balance with OECD, thousand US dollars
Unwrought nickel	22.97%	752,025	3,273,621	751,230
Unwrought alumin, um	22.22%	4,088,689	18,398,352	4,087,617
Pig iron and spiegeleisen in pigs, blocks or other primary forms	20.23%	270,355	1,336,490	270,355
Semi-finished products of iron or non-alloy steel	16.33%	706,099	4,324,140	705,668
Aluminum waste and scrap	15.62%	456,661	2,924,109	456,550
Iron and non-alloy steel in ingots or other primary forms	14.52%	11,395	78,456	11,365
Ferrous waste and scrap, re-melting scrap ingots or iron or steel	14.85%	804,456	5,416,035	804,293
Titanium and articles thereof, including waste and scrap	11.90%	138,791	1,165,954	138,370
Nickel waste and scrap	11.15%	23,120	207,422	15,292
Refined copper and copper alloys, unwrought	10.56%	859,611	8,138,220	859,425

Source: OECD, International Trade by Commodities Statistics ITCS

[20] The volumes of exports and imports were determined by the HS commodity classification from 72 to 81.

[21] In the year 1999, according to OECD statistics, the share of Russia in the importing of metal products by the member countries was 5.2%, while the share of the total Russian exports in the countries was 1.09%).

Table 4.5 Potential for Import Substitution in Russia in 1999.

	Russia's share in OECD Export	OECD Export to Russia, thousand US dollars	Total OECD Export, thousand US dollars	Russia's trade balance with OECD, thousand US dollars
Tubes and pipes, the external diameter of which exceeds 406,4 mm	12.84%	259,319	2,019,484	-259,155
Structures and parts of structures of iron or steel; plates, rods, angles, shapes, etc	0.95%	88,168	9,269,130	-74,393
Aluminum foil of a thickness (excluding any backing) not exceeding 0,2 mm	0.99%	40,936	4,135,453	-14,836
Tubes, pipes and hollow profiles, seamless, of iron or steel	0.71%	38,082	5,390,887	-22,319
Aluminum plates, sheets and strip, of a thickness exceeding 0.2mm	0.37%	36,591	9,838,628	119,479
Other articles of iron or steel	0.32%	35,779	11,345,111	-28,412
Aluminum structures and parts of structures; aluminum plates, rods, profiles, prepared for use in structures, etc	1.10%	31,645	2,865,514	-30,134
Flat-rolled products of stainless steel, of a width of 600 mm or more	0.33%	27,721	8,340,622	-25,675
Flat-rolled products of iron or non-alloy steel, of a width of 600 mm or more, clad, plated or coated	0.22%	27,641	12,728,559	85,708
Aluminum bars, rods and profiles	0.17%	22,279	13,458,780	-19,412

Source: OECD, International Trade by Commodities Statistics ITCS

Russia's primary competitive products[22] are the low process-stage products such as unwrought metals, primary treatment products and scrap. In particular, in 1999, the Russian enterprises had a 22.97%

[22] The commodity group is considered as competitive if the share of its export on the corresponding OECD market is higher than the share of the total Russian exports among the total imports of OECD countries, which accounted for 1.09% in 1999, and the trade balance is positive.

share in the total exports of unwrought nickel to OECD countries, a 22.22% share of unwrought aluminum, a 20.23% share of pig iron and spiegeleisen in pigs, and a 16.33% share of semi-finished products of iron or non-alloy steel, etc.

While exporting considerable volumes of unwrought metal, Russia is at the same time a large net importer of final metal products, both of ferrous (pipes, structural metal, metal sheets and sections) and non-ferrous metallurgy (structural sections, wire, foil etc.). In comparison with other regions, Northwest Russia has better prospects for establishing domestic manufacturing of the above-mentioned products due to the existence of specialized production facilities.

For this reason, import substitution[23] can become a business opportunity for local metallurgy companies in many product groups. In the short to medium term, however, specialization and imports of higher value added goods will motivate future development of over-the-border cooperation.

The Cluster System

History and Evolution

Metallurgy and metalworking has a rather long history in the Northwest of Russia. The industry emerged here in the early 18th century, as a result of reforms initiated by Peter the Great. These reforms aimed to create national shipbuilding (navy and trade fleets) and upgrade the Russian army (manufacturing of domestic cannons, pistols, other armaments and ammunition).

Due to the above, the city of St. Petersburg became the center of metals production of the high process stage from its very creation in the early 18th century. The first foundry was established here in 1711 (now the Arsenal Plant), where gun barrels were made. Some enterprises began their operations as the sawmills and then switched to met-

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[23] Statistical cluster analysis was used for singling out the commodity groups that possess a significant import substitution potential in the sector. All the 6-digit commodity groups were divided into three clusters according to volume of imports into Russia. The first cluster is interpreted as product groups possessing substantial possibilities for creating import-substituting production in Russia. These product groups are presented in the Table "Potential for import substitution."

allurgy (for example Izhorskije Zavody, where production of anchors and copper sheets began in 1762). The following important enterprises were also founded in St. Petersburg before 1917: the Berde Plant (1792); the Cast Iron Plant in Kronshtadt (1789) (now Kirovsky Plant); Alexandrovsky Cast Iron Plant (1825) (now Proletarsky zavod) and others. Non-ferrous metallurgy started to develop in 1857, when Rosenkranz, the first Russian copper rolling plant (now Krasny Vyborzhets) was established in St. Petersburg.

Steel and cast iron production in the Northwest was concentrated in St. Petersburg: Admiralteisky, Izhorskije and Obukhovsky (state-owned before 1917), and Putilovsky and Nevsky (private before 1917) plants. The first open-hearth furnaces were built at Obukhovsky and Putilovsky plants in 1872-73, and the first electric furnaces were also installed there.

The other important region where metallurgy has historic roots is the Republic of Komi (beginning in the mid-18th century). The three foundries were built on the banks of the River Sysola close to the ore deposits in this region. By the late 18th century, Nyuvguimsky Plant was the largest in this area and employed between 1,500 to 2,000 workers.

In the Olonets province, too, (now the territory of the Republic of Karelia) ferrous metal ores were extracted and processed beginning at the end of 18th century. The annual volume of cast iron output was about 1.3 million metric tons, and of steel more than 2.6 million metric tons. Today this industry is represented by the Karelsky Okatysh (ore pellet manufacturer) that was begun in 1982 at the site of the iron ore deposits near Kostomuksha.

The history of metallurgy in the Vologda region began when the giant steel works Severstal was built in the city of Cherepovets. The plant was built in 1955, and in 1956 the steel rolling plant started to operate. Both plants are part of the Severstal Group at the present time.

In the 20th century, such enterprises as the Pechenganickel, the Volkhov Aluminum Plant and others were founded in the Northwest. The Volkhov Aluminum Plant began its operation in 1932, while the exploitation of Tikhvin Alumina Field and nepheline mines of the Pikalev field began in 1923.

In the 1930s, a strong R&D was created to serve the needs of metallurgy in the Northwest and the entire Soviet Union. The most important among them are the Giprometiz (industrial site and facility planning), Giproruda (mining) and VNII Mekhanobr. A number of

machine-building research institutes (NIITMASH, Polzunov CKTI and others) were also involved in metallurgy R&D.

Cluster Sub-sectors

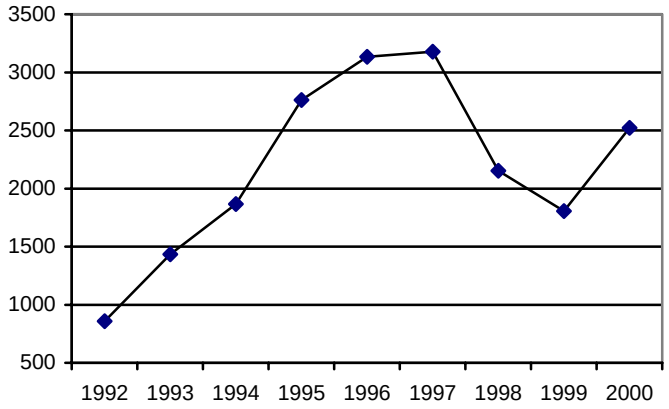
The Northwest Russia metallurgy cluster has two major value systems (sub-sectors), which have substantial possibilities for cooperation and synergetic connections. These are:

- Ferrous metals,
- Non-ferrous metals.

Ferrous Metallurgy

Ferrous metallurgy is one of the basic industries of the Northwest of Russia. It contributes greatly to the development of the region and provides 13.1% of the regional industrial output. The Northwest ferrous metallurgy companies are involved in the full cycle of metallurgy production, from iron-ore extraction to final products manufacturing.

Figure 4.2 Production of the Ferrous Metallurgy of the Northwest in 1992-2000, million US dollars.



Source: Goskomstat (2001)

Table 4.6 Production of the Ferrous Metallurgy of the Northwest in 1990-2000, thousand metric tons.

Key Products	*1990*	*1996*	*1998*	*1999*	*2000*
Iron ore	20,998	12,417	13,792	14,527	14,153
Steel	13,342	9,510	9,110	9,680	10,222
Rolled metals	10,922	7,778	7,730	8,196	8,662
Coated sheet and plate	284	456	466	469	468
Steel share (high accuracy)	70.5	19.9	22.1	19.1	26.5
Steel pipes	406	168	189	229	283
Ware (carbon and alloyed types of steel)	107	42.3	48.7	55.8	79.3

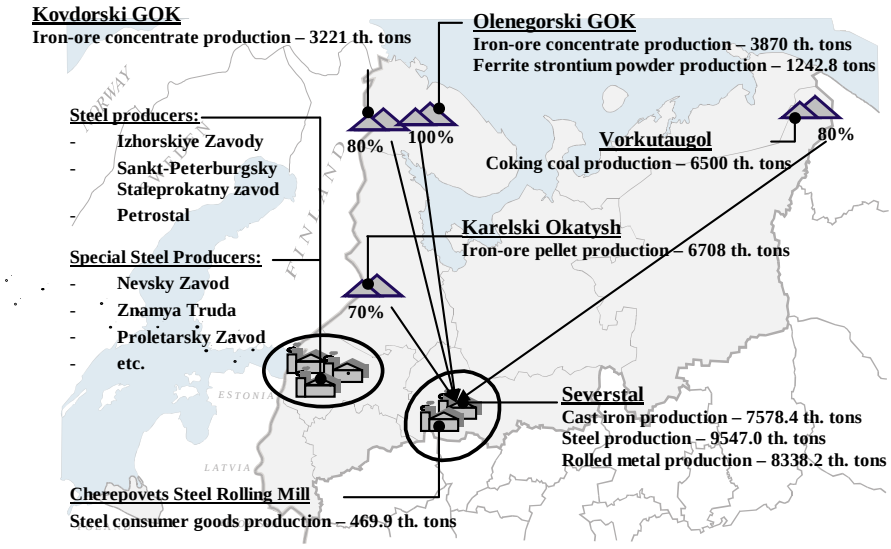
Source: Goskomstat (2001)

The key role in the ferrous metallurgy sub-sector is played by the Severstal group, primarily by the Severstal metallurgy plant (Cherepovets, Vologda region). This holding also includes two iron-ore mining enterprises, Olenegorski GOK (Murmansk region) and Karelski Okatysh (Republic of Karelia), and the largest Russian metalware producer Cherepovets Steel-Rolling Mill (Vologda region). The holding also owns a significant block of shares of Vorkutaugol, which is the largest coking coal supplier for Severstal.

St. Petersburg is the second largest metallurgy center in Northwest Russia. A high level of integration with the mechanical engineering industry contributed to the growth of metallurgy producers specializing in the manufacture of final product groups - special alloyed steels, preprocessed intermediary products for engineering, etc. (Petrostal, Izhorskiye Zavody, Znamya Truda, Proletarsky Zavod, etc.). In addition, large number of R&D centers are located in the city, some of which are the leaders in their fields (Giprometiz, Prometei, Mekhanobr, etc.).

The agglomeration of scientific centers, mechanical engineering companies and potential consumers, i.e. metals producers in the Northwest could stimulate the development of globally-oriented producers of equipment for metallurgy and metalworking. At present, there are several large machinery and equipment producers for the metallurgy and metalworking cluster in the region: Izhorskiye Zavody (rolling mill machinery, equipment for hydraulic testing of welded and seamless pipes, etc.), Kaliningrad carriage plant (dump cars, electric loaders, containers for bulk and lump freight), Mekhanobr (machines for crushing, ore-dressing, etc.), Nevsky Zavod (compressors) and Caterpillar-Tosno (freight machinery).

Figure 4.3 Location of the Northwest Ferrous Metallurgy.



Source: data provided by the mentioned companies

The largest Finnish metallurgy and other companies work in close contact with Russian metal and hardware manufacturers. The foundation for these contacts was partly laid during the Soviet period. The Former Soviet Union supplied most of the machines needed in Rautaruukki's Raahe steel factory. Experts of Soviet steel factories supervised assembling work and trained Finnish personnel. That was also the starting point for many good over-the-border friendships within industry. Finnish building firms participated in the construction of Karelsky Okatysh, and Rautaruukki became an important customer from the very beginning. Nowadays, co-operation between Outokumpu and Norilsk Nickel and the joint construction of crushing-and-sorting plants by Russian companies together with Metso Minerals are good examples of close contacts and also important technology transfer.

Two major fields of cooperation between Finnish and Russian companies can be emphasized - the marketing of raw materials, and the transfer of technologies. Russian companies provide a significant portion of the raw materials for Finnish metallurgy (see Chapter 2), in particular, Rautaruukki's cooperation with the companies of Severstal Group (Karelsky Okatysh is a large supplier of iron-ore pellets for Rautaruukki plants, Severstal delivers primary steel slabs). Kuusankoski collects scrap, aluminum and nickel from Northwest Russia. There are collecting points in St. Petersburg, Petrozavodsk,

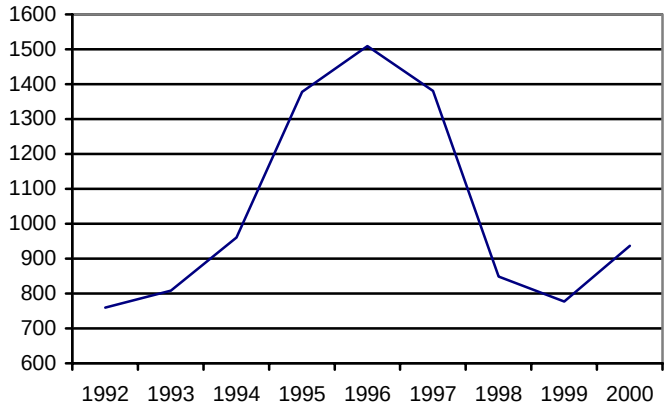
Murmansk and Archangelsk. Aluminum undergoes further refinement in the company's subsidiaries in Vyborg and St. Petersburg.

In the field of equipment and technology supply, Outokumpu and Metso Minerals are the leaders. In particular, the largest projects of Outokumpu include joint construction of a new concentrating mill in Norilsk with Norilsk Nickel. It has also co-operation with Gipronickel research center, etc. Metso Minerals, together with Russian companies (Lenstroymaterialy and Interleasing), are constructing a crushing-and-sorting plant in the Leningrad Region that will produce cubiform crushed stone.

Non-Ferrous Metallurgy

About fifteen large non-ferrous metallurgy companies operate in the region, most of them engaged in mining and primary metaworking. The share of the non-ferrous companies in the total volume of industrial production in the region amounts to 5.6%.

Figure 4.4 Production Rates of the Non-Ferrous Metallurgy of the Northwest in 1992-2000, million US dollars.

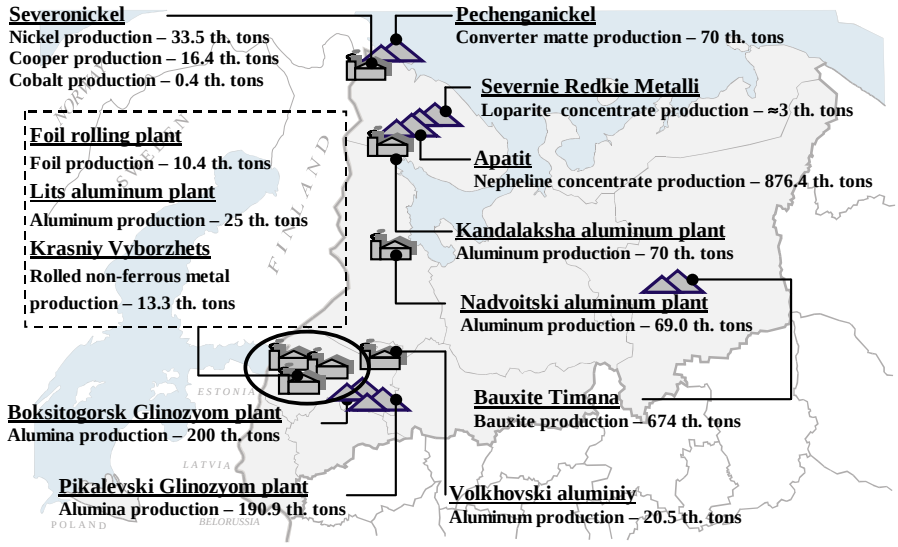


Source: Goscomstat (2001)

The structure of non-ferrous metallurgy in the Northwest is determined by the location of its ore deposits. The Murmansk region is the largest non-ferrous metallurgy center of the Northwest. A considerable number of the non-ferrous ore deposits are concentrated there. The Pechenganickel (nickel matte) and Severonickel (copper, nickel and

cobalt out of matte) plants were built on the sites of copper-nickel deposits discovered in the 1930s in this area. Currently, both are part of Norilsk Nickel Company. The Apatit mining company was founded on the basis of the apatite-nepheline ore deposits in Khibiny, and is the only nepheline concentrate (raw material for alumina) producer in Russia. The Murmansk region also has the only mining enterprise producing rare-earth metals ore, the SevRedMet.

Figure 4.5 Location of the Northwest Non-Ferrous Metallurgy.



Source: data provided by the mentioned companies (2001)

The Leningrad region is the second largest center of non-ferrous metallurgy in the Northwest of Russia. There are a number of companies in aluminum production, due to significant deposits of alumina, as well as cheap energy (Leningrad Nuclear Power plant, Volkhov Hydro Power Plant). The largest companies in the region are Pikalevsky Glinozem, which produces alumina out of its own raw materials and nepheline concentrate, and Volkhovsky Aluminum, which produces primary aluminum. Both companies are controlled by Aimet (UK). The second largest alumina producer in the region is Boksitogorsky Glinozem, based on Boksitogorsk bauxite deposit.

The Komi Republic, which currently plays almost no role in non-ferrous metallurgy of the Northwest, is likely to become one of its centers. Exploitation of one of the largest Russian bauxite deposits has been started in Komi (by Timan Bauxite Company, controlled by

SUAL). The possibility for the construction of a large aluminum plant is currently under consideration here.

Manufacturers of final non-ferrous metallurgy products are concentrated in St. Petersburg. The key role here is played by the Krasny Vyborzhets plant, controlled by the Interros group, which produces about 10% of the Russian non-ferrous rolled stock. The two other important companies in this segment are the St. Petersburg Foil-Rolling Plant, one of the largest foil producers in Russia, and LITS aluminum plant, involved in manufacturing of unique aluminum alloys. In addition, a large number of specialized research institutions, which conduct R&D for non-ferrous metallurgy, are concentrated in the city (VAMI - aluminium, Gipronickel - color metals, etc.).

Primary Issues and Challenges for the Future

At the start of the economic reforms, a large metallurgy, metalworking and mechanical engineering industrial complex characterized by the strong links between the companies had already been formed in Northwest Russia. Metal-working and mechanical engineering enterprises played a key role in the complex, while metallurgy was supposed to serve their needs as a supplier of intermediary products. A strong R&D base was formed as well, providing a good foundation for innovations and new product development.

During the period of reforms, the structure of this complex changed substantially. As the market for largely outdated and overpriced engineering products dramatically declined, metallurgy enterprises took over the leading positions. The low energy and labor costs during the period of transition allowed for cost advantages, and the product quality that would satisfy their new international customers (normally these products were metals of the low process stage for exporting). As a result, these companies occupy significant positions in the market segments of the low value added (unwrought metals and primary processing products) goods on the international market. Their main strategy is still cost competition, although increasing costs and deteriorating infrastructures make the prospect of sustaining these cost advantages in the medium term, quite unrealistic. There are no other visible alternatives at the present moment.

Currently, there are several agglomerations of metallurgy manufacturers in the Northwest. The largest centers are city of Cherepovets (ferrous metallurgy), Pechenganickel-Severonickel and Volkhov-Boksitogorsk-Pikalevo (both in non-ferrous metallurgy).

Metalworking and mechanical engineering companies are experiencing difficulties at present. During recent years, this field has suffered a continuous loss of professionals, a brain drain and a drop in research activity. Macroeconomic changes, privatization and other factors resulted in a breakdown of traditional ties and impaired the companies' abilities to produce complex and technology-intensive projects.

The present tendencies in metallurgy and metalworking involve restoration of lost ties and the establishment of new ones. These processes are being initiated by metallurgy companies that have substantial financial resources, due to profitable exports.

Providing answers to several topical questions will give a better understanding of the cluster's prospects. These questions are:

- Will the companies of the sector be able to conduct restructuring by divesting the less attractive (even though socially important) businesses, and concentrate their managerial and financial resources to develop their key strategic business units?
- How effective would government restructuring of the natural monopolies (transport, power production) be, the services of which make up a substantial part of the costs of metallurgy companies? Would the increase in energy costs associated with transformation of natural monopolies (energy, gas) induce the companies of the cluster to introduce costs reduction programs?
- Will the companies and the government be able to work out a common industrial policy?

Further development of the metal cluster will be influenced greatly by the global trend of moving industrial production to less economically developed locations to acquire cost advantages. Within the framework of this trend, the intensification of integration processes, including acquisition of Russian manufacturers by large foreign players, could be forecasted.

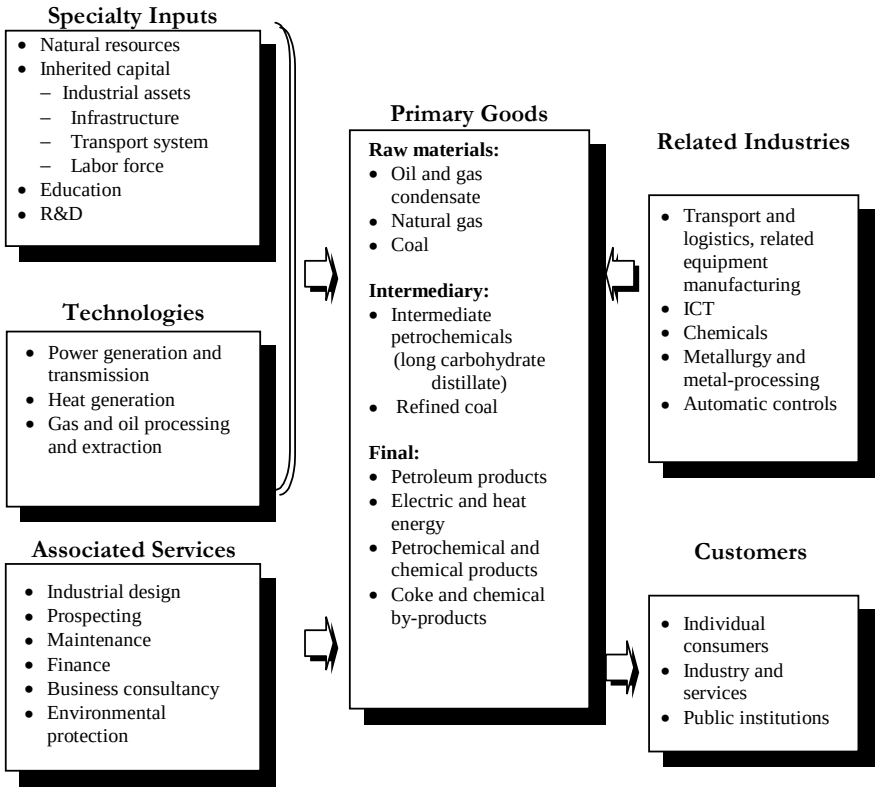
5 The Energy Cluster

Description of the Cluster

The energy cluster of Northwest Russia is presently taking shape. Expected restructuring of gas and electric power monopolies, the development of the new oil and gas fields, new investment projects and other factors could substantially alter the structure of the energy industry in the near future.

Like the metallurgy and metalworking cluster, it is based on available natural resources (oil, gas, coal, shale oil, hydropower, etc.) and substantial inherited industrial capital. In addition to this, in the Northwest region there is a highly developed education and R&D system, and several large technology and equipment manufacturers that make the region, and especially St. Petersburg, the largest agglomeration of power engineering in Russia.

Figure 5.1 The Energy Cluster Chart.



About 80% of Russia's total energy equipment for gas and oil refineries, power generation, gas and oil transport and electric power transmission is produced in the region. A substantial established base of locally produced equipment provides the regional manufacturers with good after-sale and replacement markets.

Unlike many other industries, in which markets were introduced already at the beginning of the 1990s, in the electric energy and gas sectors, the monopoly positions of the companies established in the Soviet period have been preserved, and prices have remained regulated on an actual cost and investment basis by the state and regional authorities.

The present and future of the cluster is also shaped by the dramatic decrease of oil and gas extraction and exports due to depletion of resources, and overall structural changes, which resulted in a sharp decline in domestic demand and the abandonment of inefficient deposits. The companies switched from political-based exports to operations on the competitive market. Capital flight from the sector in the early 90s and the strict tariff policy of the state in regard to natural monopolies has led to substantial underinvestment.

At present, owing to substantial export potential, the growing domestic market and improved management, energy companies are among the most prosperous and well capitalized in Russia. Oil companies invest actively in equipment renovation, extraction, and new oil and gas field development. They are paying out 80% of the total dividends in Russia today.

The other trend is that energy companies are working on divesting their non-core assets and outsourcing such activities as maintenance, service and logistics. A significant number of new specialized service companies have created competition in these areas. Technologies manufacturers, and related and supporting companies of the energy cluster, enjoy faster than average growth due to substantial demand for their products and services, i.e. equipment, technologies, design, consulting and financial services, etc.

The development of the energy cluster in the Northwest is also stimulated by transit trade and the processing of raw materials from the other regions. Already today St. Petersburg and the Leningrad region are the hubs through which the natural gas, oil, petrochemicals, coal, electric power and other commodities are exported to Western markets. The growth of transit of energy products creates further opportunities for establishing new industrial facilities (oil refineries, power plants etc) in the region.

New projects and the substantial need for renovation and upgrading in the region could create new domestic market opportunities for equipment producers of the Northwest region, which could add more strength to building a sustainable energy cluster in this region.

Cluster Mapping

The Domestic Market

Energy companies in the Northwest produce 10.6% of electric power, 4.0% of crude oil, about 15% of oil products, 8% of coal and 18.8% of coke of the total in Russia.

Table 5.1 The Energy Sector in Russia and the Northwest in 1999.

Index	Russia	North-west	Share of North-west, %
Energy Industry output, RUR million, including	722,237	67,904	9.4
Electric power industry	269,551	28,451	10.6
Fuel industry	452,686	39,453	9.0
Investment in fixed assets, RUR million, including	123,277	7,356	5.9
Electric power industry	29,847	4,361	14.8
Fuel industry	93,430	2,995	3.3
Employee, thousand	1,629	140.1	8.6
Oil production, million metric tons	305	12.5	4.0
Gas production, billion m^3	592	3.9	0.7
Oil Products manufacturing, million metric tons, including			
Gasoline, million metric tons	31.6	2.3	8.5
Diesel fuel, million metric tons	46.8	4.1	8.8
Black oil, million metric tons	50.2	10.8	20.2
Electric power, GWh	846,000	83,100	10.6
Coal production, million metric tons, including	250	19.2	8.0
Coke, million metric tons	59.8	11.2	18.8
Export of			
Oil, million metric tons	134.8	7.7	5.7
Oil Products, million metric tons	50.8	11.3	22.2
Coal, million metric tons	24.4	0.27	1.1

Source: Goskomstat of the Republic of Komi, The Energy Complex of the North-west Federal District and Kirov Region (2000), Goskomstat, Statistical Yearbook of Russia (2000)

The share of energy in the industrial output of the Northwest is rather high, and amounted to 20% of the total in the 1999. The production of fuels had the biggest share at 12%, while the share of power production was 8%. As mentioned above, the monetary value of energy production output is largely determined by prices for electric energy set by the energy market regulation authority for electricity, heat and gas, and by the world market trends for oil. It is possible that intended deregulation of the electricity market could lead to higher prices and a larger share of power production in the total output.

Labor productivity in the energy sector of the Northwest is higher than in Russia on average. This is due to the high productivity of the region's comparatively new oil extracting[24] and oil refining[25] facilities.

Today, 99% of the total electric power generated in the region, nearly all coal produced for power generation purposes, 80% of the coking coal, and 40% of the oil products manufactured in the region are consumed here as well. The other 60% of oil and oil products is exported. The share of the domestic market sales of the regional companies is tending to decrease.

Table 5.2 Indices of Foreign Trade of Russia with OECD Countries by Energy Sector Products in 1999.

Index	1998	1999
Total Exports, million US dollars	15,039	19,461
Share in total imports of OECD countries	3.46%	6.3%
Total Imports, million US dollars	1,508	190
Share in total exports of OECD countries	0.45%	0.13%
Trade balance, million US dollars	13,531	19,271

Source: OECD, International Trade by Commodities Statistics ITCS

[24] Many joint ventures operate in the Northwest. At the moment, such well known foreign players as Conoco (Polar Light) and Fortum (SeverTEK) operate in the region.

[25] KINEF (Leningrad region) is the most up-to-date oil-refining enterprise in Russia, and carries out a rather active investment policy in the renovation of its equipment.

Table 5.3 The Competitiveness of Russian Energy-Related Products, HS, 6-digit level, 1999 data.

HS #	Product	Share in OECD imports	OECD imports, million US dollars	Exports from Russia, million US dollars	Trade balance, million US dollars
271121	Natural gas in gaseous state	15.63%	19,757	3,088	3,088
270740	Naphthalene	12.81%	32,197	4	4.1
270111	Anthracite, whether or not pulverized but not agglomerated	7.86%	585,251	46	45.8
271000	Petroleum oils & oils obtained from bituminous minerals, o/than crude etc	6.59%	61,943	4,085	3,966
270900	Petroleum oils and oils obtained from bituminous minerals, crude	6.42%	176,855	11,361	11,360
270210	Lignite, whether or not pulverized, but not agglomerated	4.85%	69	3.3	3.3
270112	Bituminous coal, whether or not pulverized but not agglomerated	4.04%	13,012	525.8	525.6
270400	Coke & semi-coke of coal, lignite/peat, whether or not agglomerated; retort carbon	3.94%	1,355	53.3	50.9
270119	Coal nes, whether or not pulverized but not agglomerated	2.78%	1,168	32.4	32.4
271600	Electrical energy	2.15%	5,275	113.3	113.3
270799	Oils & other products of the distillation of high temp coal tar, etc.	1.83%	304	5.6	5.5
271112	Propane, liquefied	1.47%	5,759	84.7	84.7
270300	Peat (including peat litter), whether or not agglomerated	1.22%	539	6.6	6.5
271113	Butanes, liquefied	1.15%	2,430	27.9	27.7

Source: OECD, International Trade by Commodities Statistics ITCS

The International Market

Russia has a positive trade balance with OECD countries in the category "Mineral fuels, oils & product of their distillation, etc.," with a substantial export volume and a significant share of the OECD market[26].

The main competitive Russian products[27] here are crude oil and gas (58.3% and 15.7% of the total Russian energy exports respectively in 1999) and oil products (21%). Thus, in 1999, 95.2% of the total energy exports from Russia consisted of raw materials (Table 5.3).

One can see that there are no higher value added products among the energy exports of Russia. Therefore, increasing the share of heavily processed products in the exports is widely accepted as a priority for further development.

The Cluster System

History and Evolution

Three distinct stages can be traced in the history of the energy cluster in the Northwest.

19th century - 1920s. During this period, a number of plants for the manufacturing of steam engines were founded in St. Petersburg. After electricity was discovered, the first Russian power plants were built here. In the late 19th - early 20th centuries, the first geological prospecting for oil and coal was carried out in the southern areas of the Republic of Komi.

1920s - 1991. During the Soviet period, the resource base and infrastructure of today's energy sector of the Northwest was created. This was the GOELRO[28] plan (a single nation-wide energy system), which led to the creation of large power plants in the Northwest. In the 1930s, large-scale prospecting began in the Komi Republic, which led to the discovery of oil, coal and gas fields. During that time, large producers of

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[26] The share of the Russian imports of energy products amounts to 4.1%, while the share of total Russian exports in the total imports of OECD countries is only 1.09%.

[27] The commodity group is considered competitive if the share of its export on the corresponding OECD market is higher than the share of the total Russian exports among the total imports of OECD countries, which accounted for 1.09% in 1999, and providing the trade balance is positive.

[28] GOELRO, The first Russian program for the electrification of the country that was carried out in the 1920s by the Soviet government.

oil and coal and processing factories were built in the Republic of Komi[29]. In the 1950s - 1980s energy and power production gradually increased. At that time, geological prospecting began in other prospective regions, the production of gas was begun in the Republic of Komi, a large oil refining complex (now KINEF) was built in Kirishi in the Leningrad region, and pipeline transportation systems began to develop. In the 1970s, the two nuclear power plants (NPP) Leningrad NPP (Sosnovyi Bor) and Kola NPP were built.

1991 - to the present. The past decade has been characterized by a noticeable decrease in the volumes of geological prospecting, energy production and electric power generation. The extracting companies faced depletion of the main oil and gas deposits, and a worsening of geological conditions for their development. The collapse of the Soviet Union, the breakdown of traditional transportation and processing ties, and privatization caused large structural changes in the whole industry. In the early 1990s, the development of new oil and gas fields in Nenetsk Autonomous District was begun. In 2001, the first block of the combined heat-energy generating gas-fired power plant (Northwest Power Plant) was put into operation near St. Petersburg.

Cluster Sub-sectors

The energy cluster of Northwest Russia is comprised of a range of sub-sectors, which differ from each other in value system, technologies, ownership, regulation and competition. Nearly all of them are closely interconnected, however, and could add potentially to the creation of an internationally competitive cluster of industrial activities. We will consider the following interconnected sub-sectors of the energy cluster in the Northwest:

- Oil production
- Oil refining
- Gas production
- Coal production
- Electric power generation
- Power engineering

[29] Coal mines in Vorkuta and Inta, Ukhtinsky Oil Refining Plant, and others.

In the region there is also peat and shale oil production, but its role in the regional economy is insignificant, and these industries were, therefore, excluded from the analysis presented below.

Oil Production and Oil-Refining

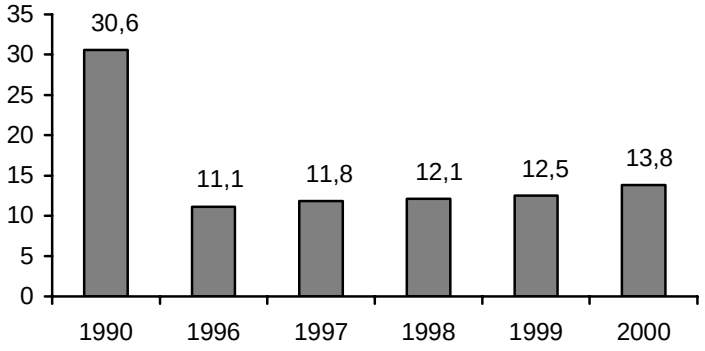
The Northwest is one of the largest oil producing regions in Russia. The region is the 3rd largest (after Western Siberia[30] and Povolzhiye) in oil production volume. One of the largest oil and gas fields, Timan-Pechora, is located here.

Table 5.4 Oil Reserves in the Northwest of Russia, A,B,C_1 Categories (Russian Scheme of Oil Reserves Estimation).

Index	Million metric tons	% of the Russian total
Russia	15,300	100
Northwest	1,396	9.1
including:		
Republic of Komi	507	3.3
Nenetsk Autonomous District	865	5.7
Kaliningrad Region	24	0.15

Source: Ministry for Fuel and Energy of Russia (2000), Lukoil (2001)

Figure 5.2 Oil Production in the Northwest of Russia, million metric tons.



Source: Goskomstat of the Republic of Komi, The Energy Complex of the Northwest Federal District and Kirov Region, 2000. Ministry for Fuel and Energy (2001). www.komistat.ru

[30] Tyumen, the main Russian oil-producing region, is located in Western Siberia.

Oil-producing companies of the Northwest are located in the Republic of Komi, the Arkhangelsk region (on the territory of the Nenetsk Autonomous District), and the Kaliningrad region. The oil resources of these regions are estimated at 1,395.6 million metric tons. The largest oil company operating in the region (and also the largest in Russia) is Lukoil. The company actively invests in the development of the transport infrastructure and new deposits. Today, Lukoil controls virtually all the large oil companies in the Northwest.[31]

In the course of the transition period, oil production in the region has fallen nearly threefold. However, a steady recovery in production volumes has been observed during the last five years.

Oil extraction in the Northwest is largely processed by regional facilities. Two large oil refineries are located in the region: KINEF or Kirishinefteorgsintez (a subsidiary of Surgutneftgaz) and Lukoil-Ukhtaneftepererabotka (a subsidiary of Lukoil).

Table 5.5 The Oil-Refining Industry in the Northwest.

	Value
Primary refining installed capacity in Russia, million metric tons	280.6
Primary refining installed capacity in Northwest, million metric tons, including	22.3
KINEF, million metric tons	17.3
Lukoil-Uhtaneftepererabotka, million metric tons	5.0
Oil primary refining, million metric tons, including	19.9
KINEF, million metric tons	16.6
Lukoil-Uhtaneftepererabotka, million metric tons	3.6
Oil products manufacturing in Northwest, million metric tons, including	
Gasoline, million metric tons	2.05
Diesel fuel, million metric tons	4.4
Black oil (with bunker fuel), million metric tons.	10.2
Utilization of capacity, %, including	
KINEF, %	94
Lukoil-Uhtaneftepererabotka, %	70

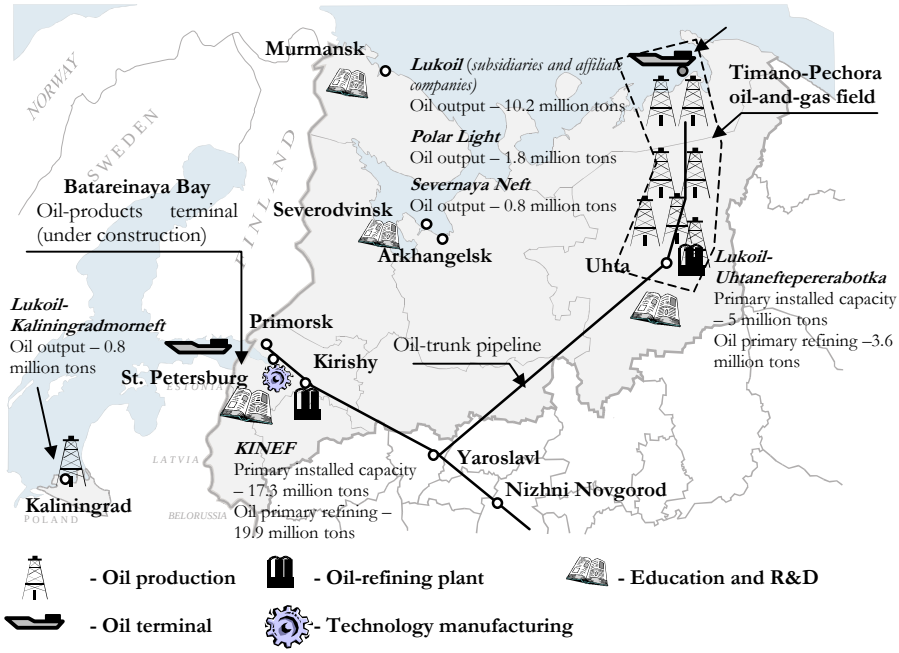
Sources: Ministry for Fuel and Energy (2000), Companies' data (2001)

[31] According to the annual report, in 2000 Lukoil`s subsidiaries and affiliated companies in the Northwest extracted 11.4 million metric tons of oil, which is 82.2% of the total production volume in the region.

These two refineries are the main suppliers of petroleum products in the region. About 35% of the KINEF products and 95% of the Lukoil-Ukhtaneftepererabotka products are sold in the Northwest. Both oil refineries are characterized by relatively simple, unsophisticated processing technologies. The KINEF has better, more up-to-date equipment and actively upgrades. This refinery benefits from access to export terminals and other transport infrastructures. The Lukoil-Ukhtaneftepererabotka is still under-utilizing its capacity and carries out rather modest investment policy.

Northwest Russia has the ambition to become the major energy-export hub of Russia. As a consequence, the oil transport infrastructure is developing rapidly in the Northwest. Two major transportation systems are under construction in the region. The first is the Baltic Pipeline System, which includes the existing oil trunk pipeline Kharyaga-Usinsk-Ukhta-Yaroslavl-Primorsk. This pipeline connects the oil fields of the southern and central parts of Pechora oil-and-gas province with the oil port in Primorsk (Leningrad region). The project is implemented by the state-owned company Transneft.

Figure 5.3 The Structure of the Oil and Oil-Refining Sector in the Northwest.



The second project implies the creation of a local oil pipeline network in the north of the Pechora oil-and-gas province, as well as construction of an oil terminal on the coast of the Barents Sea (Varandey Bay)[32]. The project is jointly financed by Lukoil and Conoco.

An oil-products transport infrastructure is also developing in the Northwest. The Surgurneftegas is investing in the oil-products terminal in Batareinaya Bay (Leningrad region), with a capacity of 7.5 million metric tons per year, and a pipeline for related oil products from the INEF refinery. There is also a project under development by the Transnefteproduct[33] for the construction of an oil refinery near the town of Primorsk and an oil-product port terminal for 10 million metric tons a year.

In the Northwest of Russia, there are several large companies manufacturing oil-extracting and processing equipment: Nevsky Zavod, manufacturing compressors, and Izhorskiye Zavody, manufacturing high-pressure tanks, reactors for oil hydro-desulfurization, hydrocracking, hydraulic purification, hydraulic dearomatization and gas separators. In the move to fill gaps left by the large producers, and motivated by the demand for small-scale customized solutions, many new smaller players are appearing in this segment, focusing on niche equipment manufacturing.

In the Northwest there are a number of universities training specialists for the oil industry. The most important is the Uhta State Technical University (Republic of Komi)[34]. Others are the Arkhangelsk Oil and Gas Institute[35], Murmansk State Technical University and St. Petersburg Mining University, St. Petersburg State Institute of Technology, and St. Petersburg State Technical University.

Research and development in the industry traditionally agglomerates in St. Petersburg. There are such well-known research facilities as VNIGRI[36] (the leading Russian oil and gas prospecting research institute), Vniineftekhim[37] and Lengiproneftekhim[38] located here.

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[32] Oil is transported from a terminal in the Varandey Bay by tankers of icebreaker class. At the present time, the first phase of the terminal is in operation.

[33] State-owned oil products transport monopoly.

[34] The core Russian specialized oil and gas industry universities are the Gubkin Russian State University (Moscow) and Tyumen State Oil and Gas University (Tyumen).

[35] The university was established in 1996, under the auspices of Arkhangelsk State Technical University.

[36] Oil and gas fields prospecting, technologies and economics.

[37] Development and application of refining and petrochemical technologies.

[38] Industrial design of oil refining and petrochemical enterprises.

Table 5.6 The Gas Industry in the Northwest.

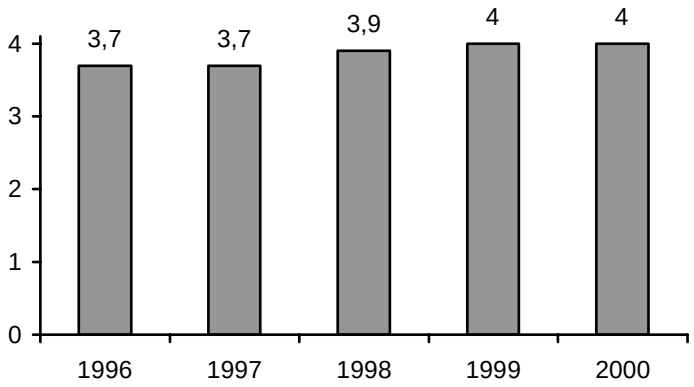
Index	Value
Natural gas reserves in Russia, trillion m^3	48.14
Natural gas reserves in Northwest, trillion m^3	3.6*
Natural gas output in Northwest, billion m^3	4.0
Natural gas transportation billion m^3, including	
Severgazprom, billion m^3	76.8
Lentransgaz, billion m^3	70
Length of the gas-transport systems, thousand km., including	20.2
Severnoe Sijanie gas-pipeline, thousand km	7.3
Liquefied gas production (Severgazprom), thousand metric tons,	134
Liquefied natural gas production (Lentransgaz), thousand metric tons	196.1

* 3 trillion m^3 fall to the Shtokmanovskoe gas-condensate field on the Barents Sea offshore.
Sources: Ministry for Fuel and Energy (2000). Goskomstat of the Republic of Komi, The Energy Complex of the Northwest Federal District and the Kirov Region, 2000. Companies' data (2001)

Gas

The Gazprom affiliates are the key companies in this sector. The main players are Severgazprom (gas extraction) and Lentransgaz (gas transportation). Severgazprom controls about 74% of the gas reserves in the region. The share of the Severgazprom in the natural gas production in the region is about 88%, and the average annual output exceeds 3.5 billion m^3. At the moment, the reserves of most of the gas fields have been depleted, and new, smaller gas fields have been started.

Figure 5.4 Natural Gas Production in the Northwest, billion m^3.

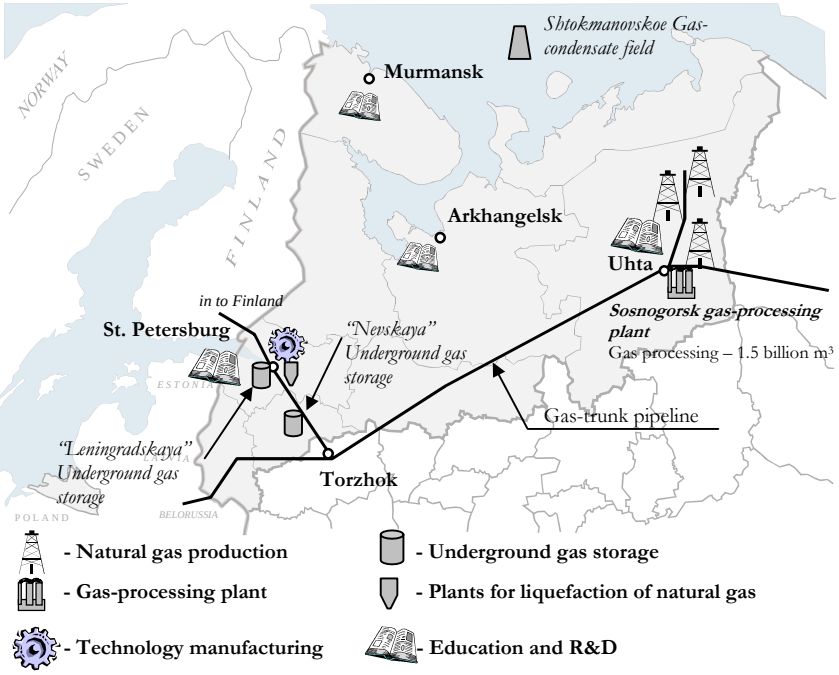


Sources: Goskomstat of the Republic of Komi, The Energy Complex of the Northwest Federal District and the Kirov Region, 2000. Ministry for Fuel and Energy (2001). Gazprom (2001)

Natural gas is processed in the Republic of Komi (Sosnogorsky Gas Processing Plant, a subdivision of Severgazprom) and the Leningrad region (subdivisions of Lentransgaz). Underground storage premises are located in the Leningrad and Novgorod regions (Lentransgaz).

A large gas pipeline runs through the territory of the Northwest[39]. Severgazprom and Lentransgaz form a unified gas transporting system, which also provides gas exports from the region. The gas for exports is mostly delivered from northern districts of the Tyumen region and from gas fields of the Republic of Komi.

Figure 5.5 The Gas Sector in the Northwest of Russia.



There are many machine-building companies in the Northwest which manufacture equipment for the gas industry. Almost all of them are located in St. Petersburg and specialize in gas transportation equipment. The largest gas equipment producers, which formerly actively exported their machinery and technologies, are Nevsky Zavod

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[39] The main gas pipeline is Severnoye Siyaniye. It transfers gas from Tyumen region (the largest gas region in Russia). The gas pipeline is laid up to Torzhok town (Tver region). The gas then enters the Lentransgaz gas transporting system.

(gas turbines, compressors, other pumping equipment), Turbine Blades Plant, ZTL (turbines blades), Kirov-Energomash (pumping equipment), etc.

Educational and R&D centers specializing in the gas industry are located in St. Petersburg, Uhta, Arkhangelsk and Murmansk (see Oil Production and Oil-Refining). The St. Petersburg-based research and development institutes, VNIGRI and Giprospetsgas[40], serve the needs of the gas industry all over Russia.

Electric Power

The electric and heat power supply in the Northwest is provided by the:

- nine regional power generating companies (Lenenergo, Karelenergo, Kolaenergo, Arkhenergo, Komienergo, Vologdaenergo, Pskovenergo, Novgorodenergo, Yantarenergo), affiliated with RAO UES of Russia;
- three large power stations (Pskov Thermal Power Plant, Pechore Thermal Power Plant, Northwest Thermal Power Plant), which are under direct control of RAO UES of Russia;
- two nuclear power plants, Leningrad Nuclear Power Plant, reporting to the Ministry of Russian Federation for Atomic Energy (MINATOM), and Kola Nuclear Power Plant, supervised by the Rosenergoatom[41].

Table 5.7 The Electric Power Industry in the Northwest.

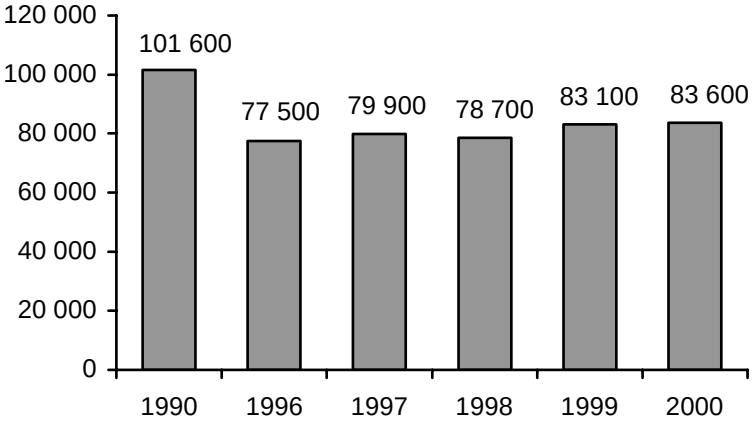
Index	Value
Electric power installed capacity in Russia, MW	212,421
Electric power installed capacity in Northwest, MW	30,815
Electric power generation in Russia, GWh	879,000
Electric power generation in Northwest, GWh, including	83,600
Nuclear power plants, GWh	30,400
Hydroelectric power plants, GWh	17,100
Thermoelectric power plants, GWh	36,100

Sources: Data provided by companies (2001)

[40] One of the main R&D centers of Gazprom.

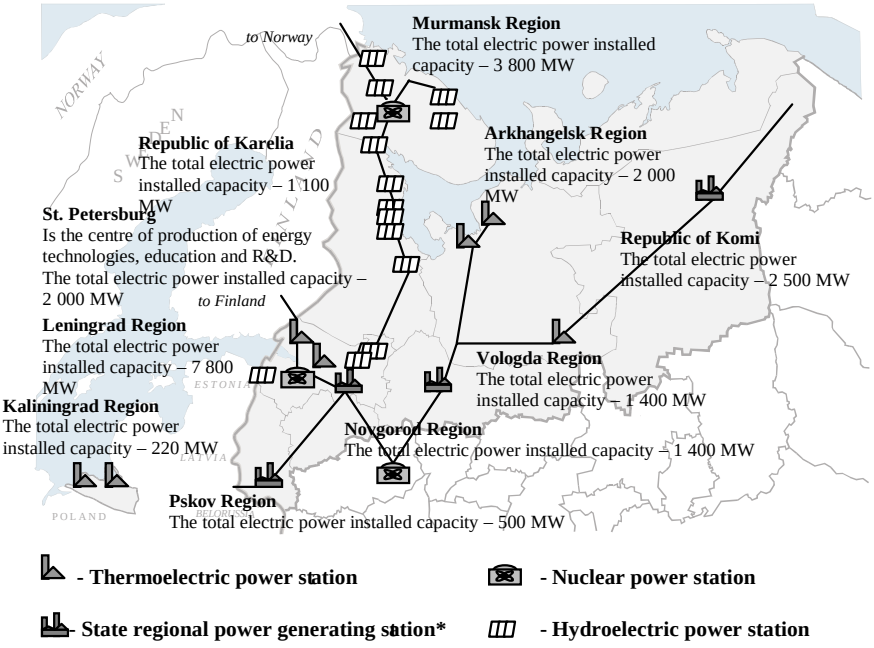
[41] The government enterprise Russian State Consortium for the Generation of Electric and Thermal Power at Nuclear Power Plants.

Figure 5.6 Electric Power Generation in the Northwest, GWh.



Sources: Data provided by companies (2001), Ministry for Fuel and Energy (2001)

Figure 5.7 The Power Production Sector in the Northwest of Russia.



* A large state-owned power (electric and heat) plant. Sources: Goskomstat (2000)

The Leningrad and Murmansk regions are the only regions in the Northwest that have excess electric energy[42]. They also dominate in

[42] Due to nuclear power plants on their territories.

power production, together providing 58% of the total in the Northwest.

The annual consumption of electric power in the Northwest amounts to about 82,500 GWh, which represents 5.7 MWh *per capita*. The regions where industrial production is concentrated are the main consumers of the electric power. St. Petersburg, for example, consumes 15,600 GWh of electric power, the Murmansk, Leningrad and Vologda regions 12,600, 12,100 and 12,000 GWh respectively. The above-mentioned four regions consume 63% of the total electric energy in the Northwest.

The primary fuel for most thermo-electric power stations is natural gas. In power production the portion of gas equals 96% (Leningrad region) of the total. Black oil and coal are mainly used in the regions remote from gas pipeline network, i.e. the Arkhangelsk, Vologda, Murmansk and Kaliningrad regions.

As mentioned previously, St. Petersburg has traditionally been the main center of power engineering in Russia. Such companies as Electrosila (turbo- and hydro-generators), Leningrad Metal Factory (hydraulic turbine, steam condensing and back-pressure turbines), Izhorskiye Zavody (equipment for nuclear power plants), Elektroapparat (high voltage equipment), etc. occupy the leading positions on the domestic market for energy equipment. Unfortunately, a substantial decrease in capital investments and, consequently, of demand for power engineering products during the period of reform has forced the companies to focus mostly on the replacement market.

Educational institutions in power production facilities are located in almost all regions of the Northwest[43]. The R&D organizations[44] are concentrated in St. Petersburg. Most of them are affiliated with RAO UES of Russia or are state-owned.

Coal

The coal industry in the Northwest is represented by coal mining companies located in the Republic of Komi, which develop the coal fields of Pechora basin. This coal basin provides the raw materials for power generation and the by-product coke industries. In total, 12 coal fields have been discovered on the territory of the region. Five of them are presently being exploited. At the moment, there are four large coal companies,

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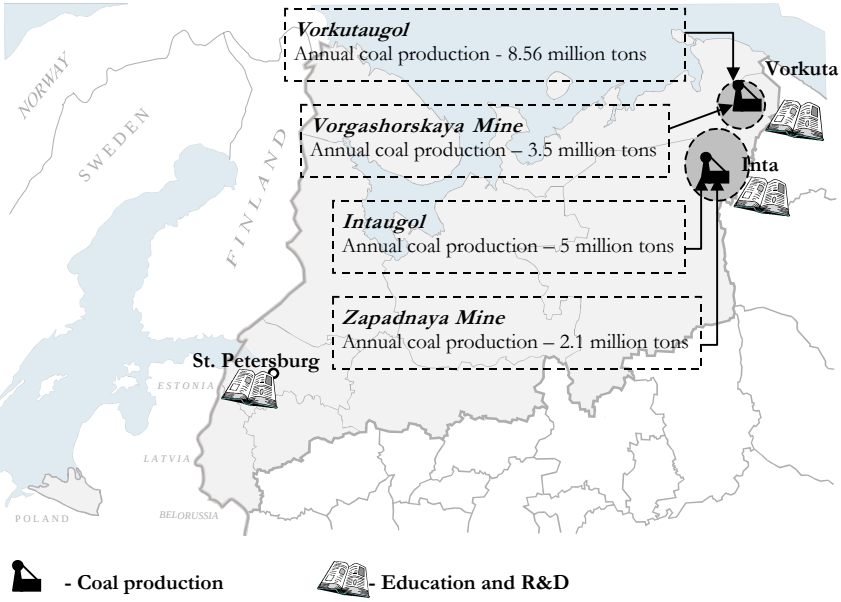
[43] The largest being St. Petersburg State Technical University.

[44] Lenhydpoproyekt (design of hydraulic engineering units), NIIPT (technology for transmission grids, automated control systems), Sevzapenergosetproyekt (electro-technology engineering services), RI RPA (nuclear power researches and engineering) and others.

Vorkutaugol, Vorgashorskaya Mine[45], Intaugol and Zapadnaya Mine, operating in the Republic of Komi. Their total annual capacity is 20.6 million metric tons of coal.

The Vorkutaugol and Vorgashorskaya Mine also extract coking coal. These companies provided 18.8% (in 1999) of the total coking coal production in Russia[46]. The share of coking coal in the total Pechora coal basin is 58.3%. Energy coal is mined in the area of the town of Inta, at the Intaugol and Zapadnaya mines. A small amount of energy coal is also mined at the Vorgashorskaya Mine. Around 88% of the total coal is sold in the Northwest.

Figure 5.8 Coal Production in the Northwest.



The facilities of the Northwest coal producers better than those of other coalmines in Russia. A high degree of automation and a more efficient administration result in a higher labor productivity, which is roughly two times higher than the Russian average.

St. Petersburg is the largest training center for the coal industry. The leading university for preparing engineers for the coal industry, the St. Petersburg Mining Institute, and the leading R&D institutes (VSEGEI, Giproshaht, etc.) are all located in this city.

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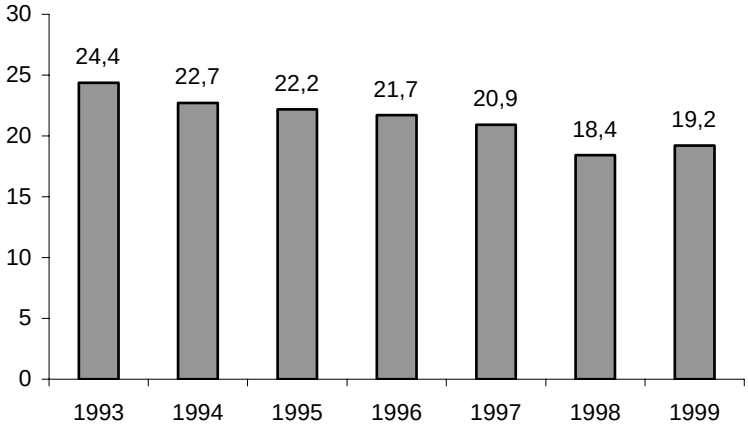
45 The acquisition of Vorgashorskaya Mine by Vorkutaugol was announced in May 2001.

46 The largest consumer is Severstal, which consumes about 80% of mined coking coal and owns 15% of Vorkutaugol.

Figure 5.9 Coal Production in the Northwest, million metric tons.



Source: Rosinformugol (2001)

The coal industry in the Northwest Federal District is still subsidized by the government. In 1999, the coal companies of the Northwest received donations from the state budget totaling $60.6 million. In 2001, however, due to the increase in prices for coal and liquidation of loss-makers, profits were registered in this sector. In the Northwest, only Vorkutaugol was profitable. The improved market situation and increasing integration with metallurgy and power production gives reason to hope for further positive economic developments in the industry in the near future.

Power engineering

Machine-building is one of the core industries in the Northwest. It includes a great number of enterprises specializing in wide a range of products. The largest companies manufacture equipment for power generation and transmission; heat generation, gas and oil extraction, transportation and processing.

Power engineering is among the largest traditional sectors of machine-building in the Northwest. In spite of this, equipment manufacturing for fuel production and processing, is quite a new sphere for Northwest manufacturers. At the moment, this market segment is developed by companies that converted their facilities from manufacturing of equipment for military purposes to power engineering, due to substantial underutilized industrial capacity. However, the produc-

tion volume and share of these enterprises in the Russian market has not yet been significant.

Table 5.8 The Largest Equipment Manufacturers for the Energy Sector in the Northwest.

Company	Products	Turnover. million US dollars	Staff, thousand people
Leningrad Metal Factory (St. Petersburg)	Steam, hydraulic and gas turbines.	71.5	5.6
Electrosila (St. Petersburg)	Hydro- and turbogenerators, alternating and direct current electrical machines, low-voltage equipment	43.75	4.9
Turbine Blades Plant (St. Petersburg)	Machined blades of steam and gas turbines	14.3	1.45
Izhorskiye Zavody (St. Petersburg)	Equipment for nuclear power plants, pressure vessels and reactors for oil refining and gas procession.	143.8	15.6
Novaya Sila (St. Petersburg)	Electrical machines	9.88	4.0
Nevsky Zavod (St. Petersburg)	Steam and gas turbines, supercharger, compressor	8.53	0.88
Proletarsky Zavod (St. Petersburg)	Gas and turbo-generators, electro and turbo-pumps	8.58	2.5
Kirov-Energomash, (St. Petersburg)	Pumping equipment, machines for drying of drilling fluid	1.88	0.69
Arsenal (St. Petersburg)	Equipment for gas-lift oil extraction and oil well productivity. Plants for nitrogen production and injection	37.3	3.6

Source: Companies' data (2001), the Federal Commission for the Securities Market of Russia (2001)

Russian power engineering is one of the most successful branches of national machine-building. The Soviet policy of overall technological self-sufficiency and independence resulted in the creation of considerable production, technology, and education facilities in power engineering. St. Petersburg became the major center of this industry in Russia starting from this period.

The concentration of large industrial companies in St. Petersburg has led to additional advantages as a result of the integration and cooperation of power engineering companies with local suppliers (castings, etc.) and components (electrical engineering, electronics and others), R&D and educational institutions[47], as well as large consumers (companies like Gazprom, UES of Russia, Rosenergoatom).

The problems of the sector that exist nowadays are typical for machine-building in Russia. They include:

- General depletion of facilities
- Lack of financial resources for the development and upgrading of new products
- Decreasing availability of skilled labor force
- Low valuations of corporate equity and debt[48]

Until now, there have been no successful examples of cooperation between Russian power engineering and foreign players in this industry. However, there are many opportunities in this field.

The current situation suggests that there is a high market potential for power engineering products[49] in Russia, and that this could encourage development and growth in this industry. The expected restructuring and liberalization of the electric energy and gas markets has already resulted in intense cooperation and growing interest of foreign investors in power engineering.

Primary Issues and Challenges for the Future

The energy cluster in the Northwest today is primarily concentrated in a small number of large companies operating throughout Russia. They enjoy limited competition as a result of an industrial structure inherited from the Soviet period. Most energy companies are regional monopolies today. This is not limited only to natural monopolies - gas and electrical power companies - but includes other industries, as well. In oil production Lukoil obviously dominates. Its subsidiaries and

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[47] St. Petersburg Technological University, St. Petersburg Polytechnical University, St. Petersburg Electrotechnical University, etc.

[48] This is connected with a low transparency of companies, internal problems and the never-ending struggle for control over assets.

[49] In Russia, there are more than 300 thermal, 40 hydropower and 9 nuclear power plants. The annual rate of the introduction of a new facility is much lower than the retirement rate.

affiliated companies produce more than 80% of the total oil in the region. The two oil refineries (KINEF and Lukoil-Ukhtaneftepererabotka) provide from 60% to 90% of the total oil products consumed in the Northwest. The energy sector has high barriers for entry. They are:

- Access to main resources (oil, gas, coal) is already reserved by a few major players.
- Access to transportation systems is controlled by natural monopolies (gas pipelines, power transmission lines) and is, therefore, off-limits for outside players and newcomers.
- Domestic market size is relatively small and the market is volatile due to state tariff regulations; achieving scale effects is difficult.
- There are numerous infrastructure and social costs associated with implementation of new investment projects.

Significant changes in the energy sector are expected only after competition is introduced. It is thought that it could lead to considerable changes in the structure, efficiency and investment attractiveness of the energy sector.

Regionally available raw materials ensure positive prospects for long-term growth in the energy cluster. The deposits of oil, gas and coal in the region (including deposits on the continental shelf) are substantial and remain under-exploited. At the same time, regions with a well-developed infrastructure and existing production are approaching the stage of decline. One could, therefore, envisage a gradual shift towards the development of these reserves that will require significant investments and could motivate improvement in the overall business climate.

However, the development of the processing industry in the Northwest could be also fueled by its position as a transport hub and the use of raw materials from other regions. The position of the Northwest as the energy trade gateway to the western markets could allow integration of the region into global networks and will favor the further concentration of capital and knowledge, thus increasing opportunities for sustaining competitiveness in the long run. This could also create new opportunities for the related engineering and technology companies, and create conditions for closer cooperation between local suppliers.

6 The Food Industry Cluster

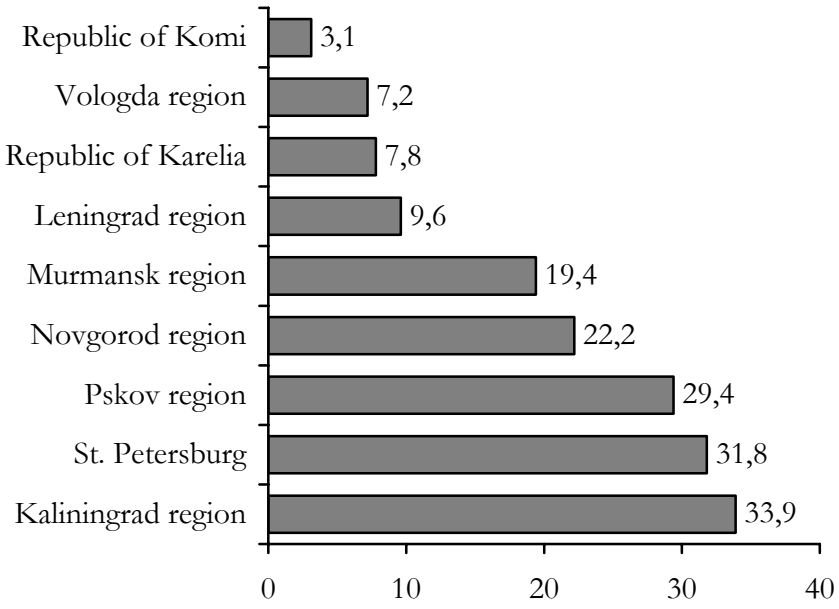
Description of the Cluster

The food industry of the Northwest is the only industry that has experienced a shift in development towards more sophisticated products.

Since 1995, food production in Russia has been growing by 5 to 7% annually, and by 15 to 20% in some segments.

At present, the share of food and beverages in the industrial structure of the majority of the regions has grown, as compared with the early 90s. In five regions, its share considerably exceeds the average Russian share of 14.7% and has a tendency to grow further [50].

Figure 6.1 Food Industry in the Industrial Production of NWFD Regions in 1999, %.



Source: Regions of Russia, Goskomstat (2001)

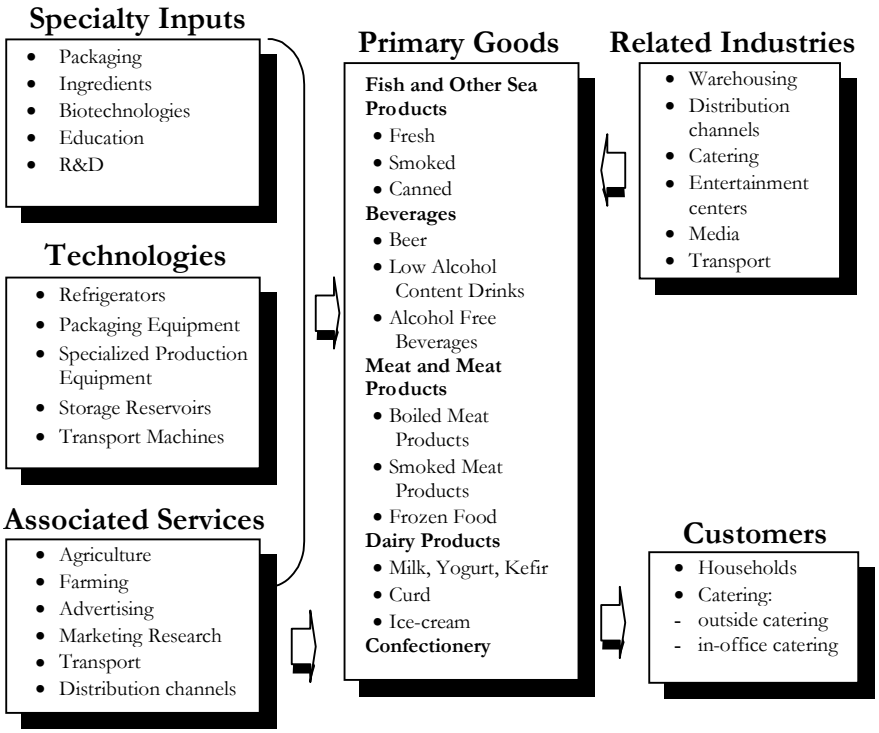
[50] For example the share of the food industry in the structure of industrial production of St. Petersburg in 2000 was already 36.7%.

The high relative share of food production in the Kaliningrad region is mainly a function of the high costs of imported goods and the concentration of meat, fish and dairy companies in the region inherited from the Soviet period.

On the other hand, the existing development, and the growth rate of food industry in St. Petersburg, as well as in the Pskov, Novgorod and Murmansk regions, points to the on-going agglomeration and regional specialization in this sector, driven by the large market potential of St. Petersburg and Moscow.

St. Petersburg is one of Russia's leaders in food production. Many of the city's food producers are well known all over Russia and their trademarks have become national brands.

Figure 6.2 Food Cluster Chart.



Since the year 1997, there is a tendency for renovation of equipment in the food industry that is driven by growing competition and efficiency pressures. Due to substantial investments in this industry today, it has the newest technologies and equipment in Northwest Russia[51].

[51] In fact, most of the market leaders have already totally renovated their production facilities.

The leading sub-sectors of the food industry in the Northwest are fish and other sea products, beverages, meat processing, dairy and confectionery.

Primary goods in the cluster are rather diverse. Fish and beer production achieved the largest volumes and benefit most from the agglomeration and economies of scale. Meat, dairy and confectionary also enjoy advantages from the concentration and development of the local infrastructure, and related and supporting industries[52].

The limited availability and low quality of local raw material supplies, especially for meat processing, diary, beer and confectionary, leads to a substantial dependence on imports. On the other hand, this shortage has motivated development and investments in local agriculture.

At present, the local equipment manufacturers either do not exist or have not been able to meet the quality requirements of the local food and beverages producers. There are only a few local manufacturers that operate today. They are oriented towards servicing the needs of small and medium-sized producers for cheaper and lower-quality solutions. Many leading firms in the food industry import almost all of their equipment. Local equipment manufacturers specialize primarily in general-purpose equipment, i.e. refrigerators, pre-packing and packing machinery, etc. However, there are also producers of specialized equipment (pasta-making, dairy and bakery production, meat and fish processing, etc). Manufacturers of the food processing equipment are concentrated in St. Petersburg, and the Kaliningrad and Pskov regions.

The labor force is trained in several institutions of higher learning in St. Petersburg: the St. Petersburg Academy of Refrigeration and Food Technologies, St. Petersburg State Agriculture University, St. Petersburg Technical University of Vegetable Polymers, and St. Petersburg Institute of Engineering and Economics. There is also a Vologda Dairy Institute in the Vologda region. Several large research institutes (Food Industry Research Institute, Research Institutes for Fats, Research Institute for Dairy Production), as well as a number of design bureaus, provide for the sector's research and development, engineering and industrial design.

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[52] In the first place, agriculture and farming, food supplements and concentrates production, etc.

Cluster Mapping

The Domestic Market

Nearly 10% of the total food products in Russia are manufactured in the Northwest. In the sectors of traditional specialization, this portion is much greater. The relative share of the Northwest in the total domestic production and processing of fish and other sea products in 2000 was 26% (34% of fish production), in beer production 23%, and in dairy 12%.

Table 6.1 The Northwest in the Russian Food Industry.

Index	*Russia*	*Northwest*	*Share of Northwest, %*
Food industry output, RUR million*	440,265	59076	13.4
Catch of fish and other sea-products, metric tons	3,776,362	1,203,707	31.9
Fish products less canned fish, metric tons	2,808,621	802,994.2	28.6
Meat, metric tons	1,193,173	113,429	9.5
Sausages, metric tons	1,052,438	104,005	9.9
Meat semi-products, metric tons	244,072	38,569	15.8
Dairy products, metric tons	2,214,710	782,674	35.3
Ice cream, metric tons	346,168	26,686	7.7
Confectionery, metric tons	1,627,711	140,563	8.6
Beer, thousand dl	515,632	119,832	23.2
Soft beverages, thousand dl	214,247	24,560	11.5
Mineral water, thousand hl	1,970,895	82,265	4.2
Food concentrates, metric tons	36,424	3,023	8.3

* - Data of 1999
Source: Goskomstat (2001)

A considerable portion of local food production is consumed locally in the region[53]. The domestic market of the Northwest is quite large (more than 14.6 million people). The increasing purchasing power of the local consumers, the development of tourism, and the advantageous location as a transport hub and domestic distribution center makes the Northwest potentially attractive for more than just the regional players. Many foreign manufacturers have established their own production facilities here. Among the success stories in the Northwest are such well-known companies as Coca-Cola, Pepsi Co., Cadbury, etc.

[53] More than 90% of soft drinks, sausages, dairy products, 64% of confectionery products, about 40% of fish products and beer.

International markets

Imports of food in Russia are rather high as compared to other industries. After decreasing considerably in 1999 (down to $4.6 billion) as a consequence of the domestic currency devaluation, in 2000-2001 food imports began growing again. According to preliminary estimates, in 2001 imports reached the 1998 level. The substantial negative trade balance suggests that Russia is a net importer of food products and that there is a potential for import substitution and development of agriculture.

Table 6.2 Indices of Foreign Trade of Russia with OECD Countries by Food Sector Products.

Indicator	*1998*	*1999*
Total Exports, million US dollars	2,993	3,121
Share in total imports of OECD countries	0.85%	0.92%
Total Imports, million US dollars	7,760	4,652
Share in total exports of OECD countries	2.43%	1.54%
Trade balance, million US dollars	-4,767	-1,153

Source: OECD, International Trade by Commodities Statistics ITCS

Russian exports occupy a significant share of the OECD markets for sea products. Sea products are also a major product group among Russian food exports. The competitiveness[54] of this product group is based on the large natural resources, long traditions, and experience of the

Table 6.3 Russian Competitive Products on the Markets of OECD Countries, 1999.

HS #	Product	Share in OECD imports	OECD imports, million US dollars	Exports from Russia, million US dollars	Trade balance, million US dollars
03	Fish & crustacean, mollusk & other aquatic invertebrate	6.69%	39,955	2,673	2,543

Source: OECD, International Trade by Commodities Statistics ITCS

[54] The commodity group is considered competitive if the share of its export on the corresponding OECD market is higher than the share of the total Russian exports among the total imports of OECD countries, which accounted for 1.09% in 1999, and the trade balance is positive.

Russian fishing fleet. However. technologies for sea product processing are outdated, for which reason the fish and sea products are, to a large extent, exported unprocessed or semi-processed.

Table 6.4 Potential for Import Substitution by 6-digit Groups, HS system, data of the year 1999.

HS #	Products	Share in OECD exports	Imports to Russia, million US dollars	OECD exports, million US dollars	Trade balance, million US dollars
100190	Wheat nes and meslin	3.16%	286	9,028	-259
020220	Bovine cuts bone in, frozen	48.17%	271	537	-271
020230	Bovine cuts boneless, frozen	7.17%	267	3,728	-267
020321	Swine carcasses and half carcasses, frozen	83.27%	207	248	-207
020741	Fowl cuts and offal, domestic, except livers, frozen	6.30%	194	3,078	-194
020329	Swine cuts, frozen nes	5.95%	190	3,183	-189
150790	Soya-bean oil and its fractions, refined but not chemically modified	18.32%	129	702	-129
100630	Rice, semi-milled or wholly milled, whether or not polished or glazed	6.44%	117	1,825	-117
151490	Rape, colza o mustard oil & their fract, refind but not chemically modified	10.87%	103	947	-103
040210	Milk powder not exceeding 1.5% fat	4.24%	103	2,424	-94,4

Source: OECD, International Trade by Commodities Statistics ITCS

In addition, there are some more competitive products in the other product groups (such as sunflower seeds, with a 10%-share of the OECD market, buckwheat with 3% of the OECD market, etc.), however, the monetary values of exports are quite small.

According to trade data analysis[55], there are certain opportunities for establishing import substitute manufacturing in Russia. There are obvi-

[55] Statistical cluster analysis was used for singling out the commodity groups that possess a significant import substitution potential in the sector. All the 6-digit commodity groups were divided into three clusters according to volume of imports into Russia. The first cluster is interpreted as product groups possessing substantial possibili-

ous cost advantages and scale economies for most imported products, if they are produced locally, for example, meat products. However, imports are substantial in this product group due to the lack of modern processing facilities and agriculture, which is underdeveloped and not supported by the government as it is in the EU.

The considerable volume of imports (the outlined ten commodity groups provide for almost $1,870 million in 1999) creates substantial opportunities for FDIs in food processing and agriculture. The current growth of domestic demand, and consequently, imports, make these opportunities look even more attractive in the short to medium term.

The Cluster System

History and Evolution

By the end of the 19th century, the food industry was already substantially developed in the Northwest. Meat and fish processing companies, dairies, liqueur and vodka distilleries, breweries, flour mills, confectionery and tobacco factories were operating successfully in immediate proximity to raw materials and consumer markets.

In the Soviet period, the food industry in the Northwest developed at a slower pace than metallurgy, the energy and forest industries, and machine-building, due to shifts in emphasis by the state planning system. However, special attention has always been paid to this industry. In the 1980s, especially intensive investment was recorded in the industry. New food enterprises were built, and old ones modernized. The average annual increase of volumes in food production grew from 2.5 to 5% during that period.

The break-up of the USSR and subsequent structural changes in the Russian economy had a negative impact on the food industry. A sharp fall in production volumes was caused by the decrease in purchasing power of the population and the low competitiveness of local food producers in comparison to foreign producers. Russian companies had not had sufficient experience in product development and marketing to act effectively on the market. Imported products filled the gap immediately.

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ties for creating import-substituting production in Russia. These product groups are presented in the Table "Potential for import substitution."

At that time, most of the farming and agricultural enterprises in the NWFD collapsed or dramatically decreased their production. This collapse of agriculture and the growing demand for food made local food processing largely dependant on imports of raw materials.

The recovery began in 1995, and a steady growth in the sector was registered after the financial crisis of August 1998, when domestic goods started to enjoy substantial price advantages due to the devaluation of the ruble. The share of imported food products decreased more than 1.5 times. All this helped regional manufacturers to increase their sales and upgrade by investing in new production facilities. The inflow of the foreign investments into the food industry has grown immensely, as well.

Before the crisis of 1998, market competition was observed mainly between domestic and foreign products. In subsequent years, competition between domestic manufacturers began to dominate, and today has become the most important driving force of development in the industry.

By 2002, the effect of ruble devaluation was exhausted, and import volumes have begun to rise again. However, there is hope, and the first signs are now being seen, that local companies have learned from previous experiences. Their investments and new business strategies are more realistic and professional. Their opportunities to reap additional advantages from agglomeration effects and synergies, as well as from the rapid development of suppliers, are substantial.

Cluster Sub-sectors

The main sub-sectors of the food cluster in the Northwest are as follows:

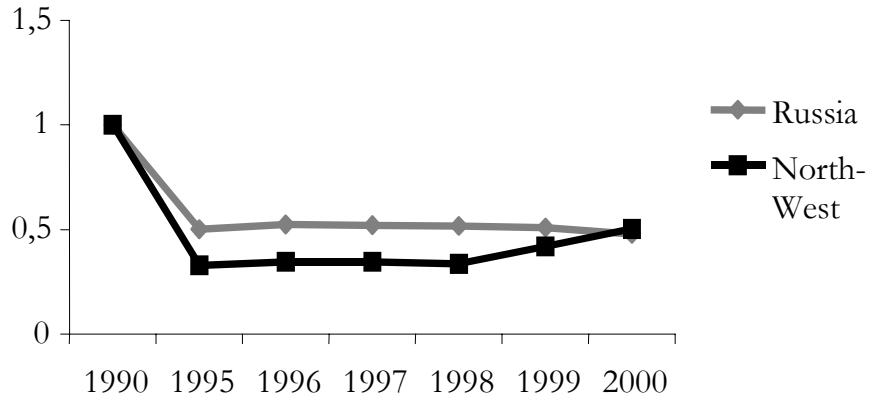
- Production of fish and other sea products;
- Production of beer and soft drinks;
- Meat and meat-processing;
- Dairy;
- Confectionery.

Manufacture of Fish Products

The production of fish and fish products is a sphere of primary specialization of the Northwest region. The fishing and processing of herring, plaice, cod, mackerel and Baltic salmon, etc. is a traditional business in this area.

There was a deep recession in the industry during the period of transition. At that time, production volumes decreased by 3 times as compared to 1990. The first signs of recovery appeared in the fish industry in 1999. In 2000, there was an increase of production volumes in the majority of the Northwest regions, despite the general Russian tendency of a decline in the fish industry. In 2000, the fish catch in the Northwest reached 1,290 thousand metric tons, which was more than 34% of the Russian total.

Figure 6.3 Production of Fish and Other Sea Products, Index, the year 1990 =1.



Source: Regions of Russia, Goskomstat (2000), Goskomstat (2001)

The majority of fishing and fish processing enterprises are concentrated in the Murmansk, Arkhangelsk, Kaliningrad, Leningrad regions and St. Petersburg, which have access to the North and Baltic Seas. The annual volume of fish catch in the North Seas alone is estimated at 1 million metric tons. The fishing companies of the Leningrad region and the Republic of Karelia also fish in Lakes Ladoga and Onega.

The largest enterprises of the industry in the Northwest are the Murmansk Fishing Fleet and the Arkhangelsk Fishing Fleet Base, which produce 171,120 and 155,655 metric tons of fish respectively. Then follow the Westrybflot (Kaliningrad), Rybprom 1 (Murmansk), the Karelian Fishing Fleet, and the Kaliningrad Fishing company Zapryba.

The leaders in fishing and primary processing are the Murmansk and Arkhangelsk regions, whose shares in 2000 were 46% and 15% of the total fish catch in Northwest respectively. The above-listed companies are the leaders in the area.

Of the total production, about 40% is consumed inside the Northwest region, another 30% is shipped out to the other Russian regions, and 30% is exported. The margin that exists at the moment between the domestic price of unprocessed fish products and prices in the markets outside Russia created favorable conditions for a large export of fresh fish. Fish processing does not attract much attention from key players in this industry, due to the substantial investments required and the lack of specific knowledge and skills.

Despite the plentiful supply of raw materials, a number of factors still impede growth of this industry. They are the worn-out fishing fleet, poor port infrastructure, and low quality of fish processing facilities.

In the Northwest, there are shipyards that traditionally specialized in the building of ships for fishing. A potential increase in demand by existing fishing companies could help to revive this activity in the region if shipyards (Avangard, Petrozavodsk) are able to offer competitive solutions for domestic fishing companies.

Production of Beer and Soft Drinks

Production of beer and soft drinks has also become one of the main areas of growth in the Northwest in the last 10 years.

Beer Production

Beer production easily overcame the recession in the mid-1990s and has experienced steady growth since then. The driving forces for the development of the sector were increasing consumer demand and inflow of foreign investments.

At present, the Russian beer market is one of the fastest growing in the world. During the previous three-year period, it grew at a rate exceeding 20% *per annum*. The growth tendency, according to experts, will continue at least until 2005[56]. The profit margin in this activity was the highest in the food industry, and reached 40% from sales for certain producers.

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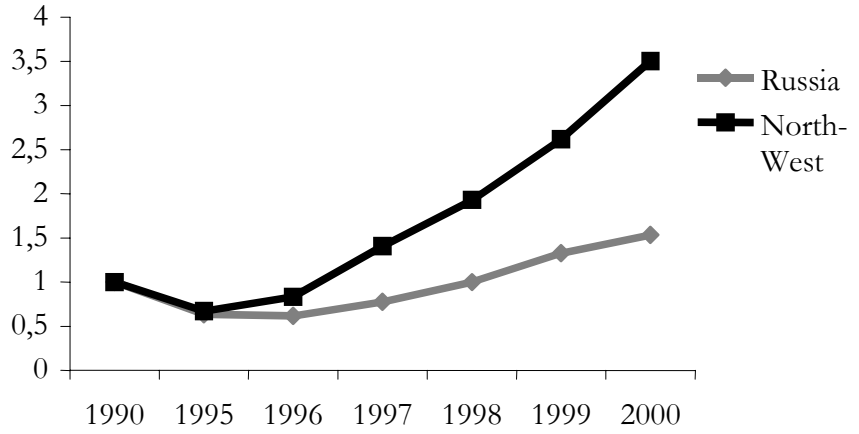
[56] In particular, the forecast for market growth for the year 2002 is 17%, and in the years to follow, this growth will somewhat slow down. In 2004, the predicted market size will reach the figure of 85 million hectoliters per year.

Figure 6.4 Beer Production, Index, the year 1990 =1.



Source: Regions of Russia, Goskomstat (2000), Goskomstat (2001)

The growth rate for beer production in the Northwest by far exceeds the overall rate for Russia on average, and amounts to 33 to 35% annually. Production volumes grew more than threefold between 1990 and 2000. About 120 million decaliters of beer were produced in 2000 in the Northwest, which is nearly 25% of the Russian total. About 95% of the Northwest beer production capacity is concentrated in St. Petersburg, which is considered to be the beer capital of Russia. Such large companies as Baltika, Vena, Bravo International, Stepan Razin and Bavaria are located in this city.

All these companies are actively investing and upgrading. They demonstrate a very good selection of brands and other marketing capabilities[57]. At present, the extension of the export markets is one of the priority goals for Northwest beer companies[58].

Lack of raw material sources remains the main problem for the beer production industry. A shortage of locally produced barley, hops, and malt, coupled with their low quality, results in significant raw material imports. At present, up to 70% of beer in Russia is produced utilizing imported raw materials[59]. So far the business strategy of

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[57] For example, according to the results of the year 2001, the Baltika brand was the third according to sales in Europe.

[58] Beer produced in the Northwest is already exported to such countries as Finland, Germany, England, Greece, Israel, Mongolia, Ukraine, Belarus, Latvia and others.

[59] The Northwest beer producers traditionally import malt from Finland, Denmark, Sweden, France, Germany.

most companies has included investments in establishing their own production of raw materials[60]. Taking into account the concentration of beer manufacturing in St. Petersburg, there are good investment opportunities for the development of local raw materials producers and specialized service firms in this location.

Equipment and accessories for beer brewing are practically all imported due to absence of local, and even national producers of the necessary units. Nevertheless, strong demand motivates investing in glass bottle manufacturing, production of the aluminum cans, etc., i.e. areas of activity that it is feasible to localize.

There is tough competition in the beer market, which leads to a demand for efficiency and skills (technical and marketing professionals, as well as managers). Specialization in beer production technologies is extremely popular among graduates seeking to a enter the Academy of Refrigeration and Food Technologies, which trains engineers for this activity.

Soft Drinks, Mineral Water, Juices

The volume of soft drinks production in the Northwest in 2000 was estimated at 24.3 million decaliters (about 11% of the total Russian output), and of mineral waters at 82.3 million half liters (4% of the total Russian output). In 2000, the leaders in soft drinks production in the NWFD were the Coca-Cola St. Petersburg Bottlers, Pepsi Bottling Group (St. Petersburg) and Bizi (Kaliningrad); in the production of mineral waters, Bizi (Kaliningrad), the Mineral Water Bottling Plant (Pskov) and Petrospirt (St. Petersburg). Lemonade and other soft drinks brands of St. Petersburg companies, such as Troya-Ultra, Polyustrovo, Aqua-Star, and others, are well known in Russia.

Today the most quickly growing niche is the production of fruit juices. In 2001, the market increased by 15-20%. A significant portion of Russian juice production is, as in the case of beer, concentrated in St. Petersburg. Such companies as Multon (27% of the market), Troya-Ultra, Aqua-Star and others are located here.

In recent years, a new segment of the Russian market - drinking water - has appeared and attained considerable volumes. The demand is expected to grow because of the bad quality of the local drinking water,

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[60] The French company Soufle jointly with Baltika has built a large malt plant in St. Petersburg. The plant will produce 100 thousand metric tons of malt annually, which is equal to one-fifth of the Russian import of this product.

which is provided by the local water utilities via largely worn-out networks.

Nowadays, domestic companies control about 75% of the Northwest market of soft drinks, and continue to increase their share. During recent years, substantial investments have been made into upgrading the production facilities, brands and expansion to other regions (building distribution networks).

The equipment in the industry is mainly imported or delivered from other regions. Local equipment manufacturers have not yet taken the opportunity provided by the agglomeration and the rapid development of local beverages producing companies, i.e. their potential customers in this region.

Meat and Meat-processing Production

In 2000, the volume of meat and poultry production in the Northwest region amounted to more than 74 thousand metric tons, sausage production to more than 88 thousand metric tons, and ready-to-cook meat products to 38.5 thousand metric tons. The share of the Northwest in Russian meat and sausage production was about 10%, and in ready-to-cook meat products 16%.

Meat and meat products manufacturing in the Russian Northwest has several agglomerations. The Vologda and Leningrad regions are the main centers of meat and poultry production. In 2000, their share in the Northwest was more than 62% of the total. The largest enterprises in the region were the Vologda Meat-Processing Plant (Vologda), Cherepovets Meat Processing Plant (Vologda region) and Meat Processing Plant Sovietsky (Kaliningrad region).

Sausage production is mainly concentrated in St. Petersburg, the Pskov and Novgorod regions - their share is 70% of the total output in the Northwest. The largest enterprises here are the Parnas-M (St. Petersburg), Velikolukski Meat Processing Plant (Pskov region) and the Novgorod Meat Yard (Novgorod region).

The sector of ready-to-cook meat products manufacturing is one of the most actively developing, i.e. in 2000, the share of Northwest in the total Russian output increased by 38% in comparison to 1999. The leading regions were the city of St. Petersburg, the Vologda, Novgorod and Leningrad regions and the Republic of Komi. The largest enterprises in this sector were the Kolpino Food Plant, Ravioli, Dariya, Kolibri (all from St. Petersburg), Meat Plant Kaliningradsky (Kaliningrad region), the

Novgorod Meat Plant (Novgorod region), the Vologda Meat Plant (Vologda region) and the Meat Processing Plant (Republic of Komi).

The main problem of the sector is also limited local farming due to the severe climate, and poorly developed infrastructure, resulting consequently, in relatively high costs. Many large meat processing companies make efforts to create their own raw materials sources by means of vertical integration and establishing alliances with farms. This development pattern is pursued by such large meat products manufacturers as the Parnas-M, Talosto, Dariya (all from St. Petersburg), and others.

The local markets in the Northwest are presently controlled to a large degree by the local large manufacturers who have managed to modernize their facilities, and often have their own raw materials sources (hence, access to lower cost raw materials). However, the situation is changing rapidly due to new entries from the other regions[61] into the market and increasing competition.

Equipment production for meat processing in the Northwest region is expected to grow. Although the present share of local equipment producers in total purchases does not exceed 20%, the common perception is that this share will grow rapidly in the near future and concentrate mostly on general-purpose equipment.

Dairy Production

In 2000, the production volume of dairy products in the Northwest was 756 thousand metric tons (calculated as milk), which is more than 12% of the Russian total.

The growth rate of production in the Northwest generally coincides with that of Russia, and amounts to 6 - 10% annually. The main dairy production enterprises are concentrated in St. Petersburg. They represent about 37% of the total volume of Northwest dairy production. The second position is occupied by the Vologda region - more than 10% of the total. The largest enterprises in this sub-sector are the Petmol, the Dairy Factory Piskarevsky (St. Petersburg), the Vologda Dairy Factory and Lactis (Novgorod region).

In recent years, the diversity of dairy products offered on the market was extended considerably, motivated by competition. However, the production capacity of many companies is still under-utilized. There are also difficulties in supplies of raw materials (milk) in this

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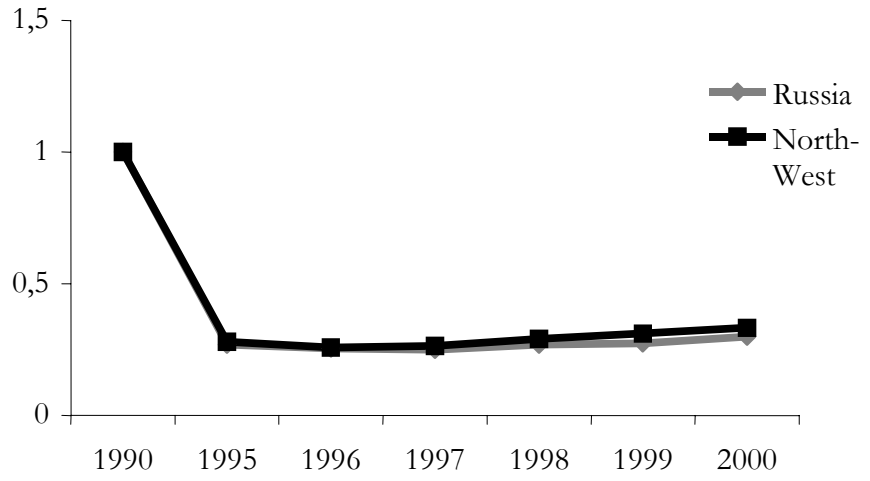
[61] Mostly Moscow-based.

industry. The growth of dairy production is primarily achieved by the use of dry unskimmed and skimmed milk, which is imported.

Figure 6.5 Dairy Production, Index, the year 1990=1.



Source: Regions of Russia, Goskomstat (2000), Goskomstat (2001)

In order to solve the procurement problem, milk-processing enterprises such as Petmol, Piskarevsky, Kolibri, etc., create various models of cooperation with regional farms that range from long-term agreements (hence, alliances) to vertical holdings[62].

Today the market for dairy products in the Northwest is saturated. In addition to products supplied by local manufacturers, some are partly delivered from other regions of Russia (lower cost goods) and, in smaller quantities, imported (higher cost and quality goods). The relative weight of the imported dairy products does not exceed 10% of the total. The tendency for consumer preferences to shift in favor of living-culture dairy products is clearly observable, offering opportunities for new entry and international cooperation.

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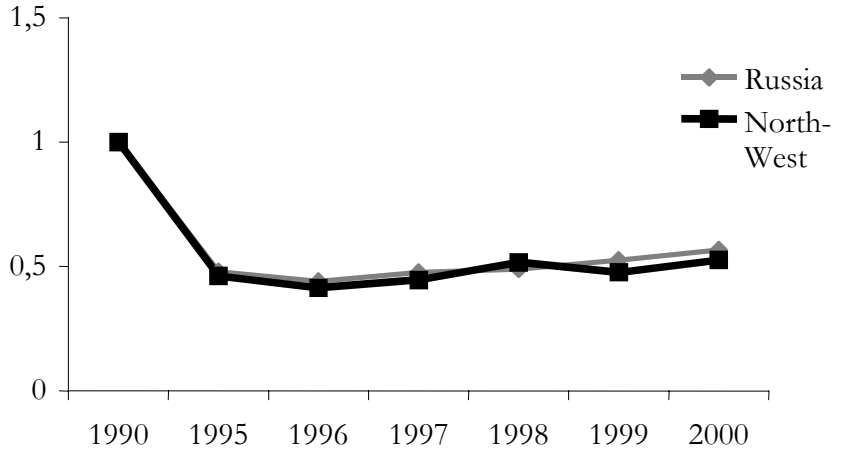
[62] For example, Petmol have centralized purchases of mixed fodder, grain, fertilizers and fuel for its suppliers. Petmol, De Laval, a number of the West European banks, and the Swedish government participated in the implementation of the program "Baltic Sea" ($3.7 million). Under this program, the milk suppliers of Petmol (11 farms) received Swedish milk production equipment, paying Petmol back with milk. Petmol, in its turn, pays back the loan under a leasing program. In 2001, Petmol signed a strategic agreement of intentions with 15 farms to legalize the establishment of a vertically integrated conglomerate.

Confectionery Production

Confectionery production has always been a better developed sector of the Northwest food industry. The sector seems to be recovering after a deep recession and is today growing 7-10% a year. In 2000, the Northwest produced more than 140 thousand metric tons of confectionery goods, which is 8% of the total Russian output.

Figure 6.6 Confectionery Production, Index, the year 1990=1.



Source: Regions of Russia, Goskomstat (2000), Goskomstat (2001)

St. Petersburg is the leader in the Northwest in this industry. Its share in 2000 was more than 60% of the total production in the region. The second position in the confectionery production is occupied by the Vologda region at 19%, and the third position, by the Leningrad region at 10% of the total. The largest local companies are the Krupskaya Confectionery factory, Azart, Pekar, Hlebni Dom, Chupa-Chups Rus (all from St. Petersburg), Russkiy Biscuit (Vologda region) and Cadbury (Novgorod region). The brands manufactured by these factories are well known in Russia. There are also some smaller, but very active, players (for example Landrin), which managed to create their own brands and are niche-players.

Confectionary production in the NWFD is dependant on imports of raw materials (cocoa beans, nuts, jellying agents, special vegetable oils, sugar, etc.). The situation makes the local producers sensitive to fluctuations on the world markets of raw materials.

It is widely accepted that the quality of confectionary products made in the region is quite good. Despite this, only 20% of confectionery products made here are sold outside the region, due to difficulties and substantial investments in marketing and distribution.

The industry needs more effective marketing, especially brand management, and investments in equipment modernization. In fact, only the foreign-owned companies Cadbury and Chupa-Chups Rus have succeed in becoming nationwide suppliers. Other companies, despite the good quality of their products, strong brands and favorable location for further expansion, are still concentrated in local markets.

Almost all the modern equipment that is being installed in the leading companies of the confectionary industry is produced abroad. Further growth in equipment manufacturing is determined by future developments in local companies in terms of their growth on the Russian market.

Primary Issues and Challenges for the Future

Despite the favorable situation and stable growth of the food industry, one needs to be aware that it is still at the initial stage of its development. Due to a short production cycle, relatively low capital intensity (in comparison with the energy and metallurgy), early privatization, foreign capital injections, and other factors, the industry grew rapidly beginning in the middle of the 1990s. The companies were initially oriented towards the domestic market and engaged in import substitution in 1998-1999. At the moment, however, a potentially large domestic market is limited by the low purchasing power of the population. Further growth in the industry will face increasing competition with imports, growing costs due to increases in salaries, energy and transportation costs, etc. Growth in wealth will result in a shift in demand for higher quality and more diverse products. To cope with these challenges, domestic food companies will have to gain competitiveness by means of differentiation and cost efficiency.

A growing number of sophisticated customers and, hence, intensification of the non-price competition in the food market will inevitably force companies to pay extra attention to the quality of their products, and marketing and development of distribution services.

As mentioned earlier, there is certain degree specialization and concentration of activities in a number of industries. This creates opportunities for development of producers who are competitive on the

national, and subsequently, on international markets. The increasing demand for modern equipment and raw materials will certainly inspire the development of local manufacturers, which might derive advantages from economies in scale and scope. This process, in turn, could push the further expansion of the food cluster.

On the whole, the food cluster demonstrates stable development and an ability to react adequately to market changes due to private ownership, a high level of competition and a significant number of foreign participants, which are acting as benchmarks for local producers in terms of quality and diversity.

7 The Information and Communications Cluster

Description of the Cluster

Telecommunications are one of the most rapidly growing sectors in the Northwest. While the main source of the current growth lies in expansion of modern ICT technologies and the increase in final demand, the background for the current development has been inherited from the industrial and human capital of the Soviet period. Educational and R&D organizations were created in the 1960-80s, within the framework of state programs for regional electronics production development[63], and this continues to supply the cluster with a professional labor force and know-how, and thus to fuel further development.

The key products of the cluster are, first, communication services, both wired and cellular, as well as data transmission and Internet access services. In the Northwest of Russia, the convergence of information and communication technologies has not developed as greatly as it has in Western countries, although the tendency is clearly visible. For this reason, the key products of telecommunications and IT are reviewed separately in the single structure of the ICT cluster. This is the core of the cluster, which is now rapidly developing, due to the spread of modern technologies and the growth of final demand for these services.

After a deep recession caused by the collapse of the Soviet Union and the subsequent breakdown of production ties, telecom equipment manufacturing in Northwest Russia is beginning to recover. Development of computer engineering resulted in quick growth of information technologies, which became one of the key product groups in the cluster.

The development of the industries of the Northwest ICT cluster would have been impossible without the existing educational infrastructure and R&D potential. The available advanced educational base, and the R&D infrastructure, helped information technologies to develop quickly. At present, IT services are the only significant export article in the cluster.

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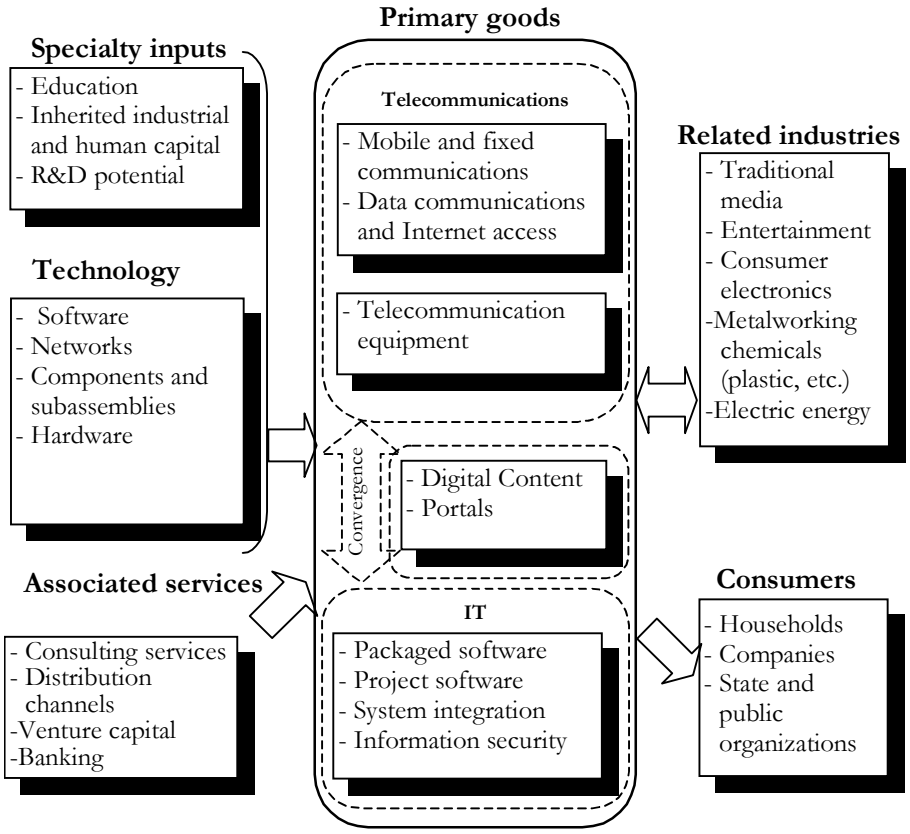
[63] Kolosovsky N.N. Theory of economic regions, Moscow, 1969.

Figure 7.1 The Northwest ICT Cluster Chart.



The ICT cluster does not cover the whole ICT value system. Equipment manufacturing declined dramatically during the period of transition. At the moment, there are no effectively functioning local manufacturers of components, modules and subassembly. However, there is still substantial industrial and human capital inherited from the Soviet period. During that period, the Northwest was a main center of ICT equipment production and, therefore, the main facilities for all stages of production (from components to final products) were established here. One might mention the Svetlana and Leninets plants, among others, which were among the main manufacturers of electronic components and modules in throughout the USSR. These conglomerates employed each more than 30,000 workers during the Soviet era. This inherited capital could still be important for potential recovery in this area of activity.

As talented professionals left, spin-offs from stagnating giants became the major reason for the appearance of many small producers in the region. Such companies as Perspectivnie Tehnologii, Bercut, and Opten

started production of modern ICT equipment and achieved certain positions in their respective domestic markets.

In addition to the abovementioned local manufacturers, international companies such as Lucent Technologies and NEC established joint ventures to produce telecom equipment. Furthermore, the Northwest is one of the main centers for software development in Russia, and a number of specialized software developers operate here, e. g. Petersevice, Reksoft, etc., producing software for telecommunications.

In the ICT services sector, the situation is much better than in related equipment manufacturing. Many companies offer telecommunication services. The markets, however, are still far from perfect and have a monopolized access to certain facilities. Mobile communications competition is only beginning, with the appearance of a second GSM operator that has recently started its activity (MTS, Moscow) in this area. In wire communications, the new operators offer higher quality digital services and focus mostly on corporate clients, while households still have no choice and are forced to use traditional providers that offer poor services at low cost.

The development of content is a new business in the Northwest, and, at the moment, there are no easily-recognizable local brands in this area. However, the INFON and SPIK companies, which operate in this sector, deserve mention. Another problem here is a global one, i.e. content, that is really attractive for consumers, is only just coming here as well.

Cluster Mapping

The Domestic Market

The telecommunications market in Russia was reduced dramatically after the financial crisis and devaluation of the ruble. Having reached a volume of $7 billion in 1997, the market accounted for only $4 billion in 1999. In 2000, telecommunication services began to recover and showed a spectacular 25% growth.

The Northwest is the second largest telecommunications market in Russia after the Central Federal District, where Moscow occupies 43% of the Russian total market size[64].

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[64] Moscow is a capital and the main business center in Russia; therefore, the market for telecommunication services is much larger than in other regions.

Table 7.1 The Telecommunications Market according to Federal Districts in 2000.

	million US dollars	*Share in Russia*
Russia	**5 153**	**100%**
Central Federal District	2,661	51.6%
Northwest Federal District	635	12.3%
Privolzhski Federal District	589	11.4%
Siberian Federal District	390	7.6%
Southern Federal District	341	6.6%
Urals Federal District	311	6.0%
Far East Federal District	224	4.4%

Source: Russian Ministry for Telecommunications and Informatization, http://www.minsvyaz.ru/.

The telecommunication services market of Northwest Russia is strongly concentrated in St. Petersburg. The share of communication services in the GRP here is 5%, which is close to the average in developed countries, whereas in Russia overall, the average is substantially lower, at 2% of the total[65]. This fact demonstrates the relatively high level of penetration and market concentration of telecommunication services in the city.

The Northwest plays a significant role in domestic telecommunication equipment production. Due to the state planning policy pursued during the Soviet period, the electronics scientific-industrial complex was created in the Northwest with St. Petersburg as its center. Perestroika, the break-up of the Soviet Union and the economic transition caused a substantial decline in the electronics industry and the destruction of user-producer networks. The Northwest, however, still remains the main center for telecommunication equipment production in Russia.

Its geographical proximity to Europe, as well as its available scientific and research potential, have in practice made St. Petersburg the center of innovations in the telecommunications IT in Russia. It was here that the first Russian cellular communication network appeared in 1991 (Delta Telecom), and where the first optical fiber networks for data transmission were built. At present, the Northwest is an important location in Russia in data transmission, and functions as a kind of

[65] Source: Russian Ministry for Telecommunications and Informatization, http://www.minsvyaz.ru/.

"digital window to Europe," since the main optical fiber channels that connect the Russian communications and data transmission networks to Finland, and, via this country's networks, to Europe and the rest of the world are laid, and also run from here.

Table 7.2 The Telecommunications Market in the Northwest of Russia in 2000.

	million US dollars	*Share in the Northwest market*
Northwest Federal District	**635**	**100%**
St. Petersburg	407	64.0%
Murmansk Region	34.9	5.5%
Kaliningrad Region	31.9	5.0%
Arkhangelsk Region	31.6	5.0%
Republic of Komi	29.5	4.6%
Leningrad Region	28.6	4.5%
Vologda Region	24.0	3.8%
Republic of Karelia	17.8	2.8%
1ovgorod Region	16.3	2.6%
Pskov Region	13.7	2.1%

Source: Russian Ministry for Telecommunications and Informatization, http://www.minsvyaz.ru/

The Northwest plays an even more important role in Russia in IT. The higher education institutions of St. Petersburg have achieved considerable success in offering high quality training in a wide range of IT development areas. St. Petersburg, consequently, has become the leader among the three main centers of software development in Russia (the other two being Moscow and Novosibirsk), and is the main concentration of the offshore programming due to strong contacts with the international IT community.

Its location near the international border, its proximity to the leading European information technology agglomeration of Finland and Sweden, and a high level of specialized education, favor further development as the most important agglomeration nationally, and in some perspectives, even globally.

International Markets

Today Russia is an import-oriented country in the area of telecommunications.

Table 7.3 Russian Foreign Trade in ICT Products with OECD Countries.

Indicator	1998	1999
Total Exports, million US dollars	126.1	118.8
Share in total imports of OECD countries	0.03%	0.03%
Total Imports, million US dollars	1,904	1,006
Share in total exports of OECD countries	0.47%	0.24%
Trade balance, million US dollars	-1,778	-887

Source: OECD, International Trade by Commodities Statistics ITCS

Imports of ICT equipment decreased considerably in 1999, as a result of the devaluation of the ruble after the financial crisis in 1998. However, accelerating growth in demand for telecommunications, and especially for cellular services in 2000-2001, has led to substantial investments and a related increase in imports of telecommunication equipment above the levels achieved before the financial crisis of 1998.

The dramatic decline in the electronics industry in the 90s led to the evaporation of competitive products manufactured domestically. The share of Russian exports of telecommunication equipment among OECD imports amounts only to 0.03%[66]. There are some competitive products[67], nevertheless, though exports of these products are very small.

In the markets of electric applications for telephony, applications for radiotelephony and the micro assemblies market[68], the share of Russian commodities did not exceed 0.02% in 1999[69]. However, there may be hidden potential for development, as a significant amount of skills, training and facilities are centered in Russia (in the Northwest, in particular).

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66 Source: OECD, International Trade by Commodities Statistics ITCS.

67 The commodity group is considered competitive if the share of its export on the corresponding OECD market is higher than the share of the total Russian exports among the total imports of OECD countries, which accounted for 1.09% in 1999, and the trade balance is positive.

68 These are the largest OECD markets in ICT sector.

69 Source: OECD, International Trade by Commodities Statistics ITCS.

Table 7.4 Russian Competitive Products in OECD Market in 1999.

HS #	Products	Share in OECD imports	OECD imports, million US dollars	Exports from Russia, million US dollars	Trade balance, million US dollars
854081	Receiver or amplifier tubes	5.50 %	51	2.8	2.7
854049	Microwave tubes, nes	1.31 %	132	1.74	1.58

Source: OECD, International Trade by Commodities Statistics ITCS

Russia has a negative trade balance with OECD countries in telecommunication equipment. Taking into consideration the fact that there is substantial human and physical capital, and traditions remain in place, it is reasonable also to look at the potential for import substitution in the sector and analyze demand for imports in this segment.

An analysis of the trade data[70] was used for this purpose. The product groups outlined present considerable potential for creating import-substituting manufacturing of the listed products in Russia. The possibility to reach economies of scale on the domestic market, as well as to benefit from potential cost and unique skill advantage, could also facilitate the exports of these products in the medium term.

The current volume of imports is considerable. The five commodity groups listed above represented in total almost $560 million in 1999. The fact that in 1998 these five commodity groups provided for about $1 billion[71] of imports deserves mention. The growth of imports in 2000-2001 due to accelerating development of the telecommunication service providers suggests that the potential for domestic production is growing and that there are good prospects for its further increase in the near future.

Among other Federal Districts in Russia, the Northwest, along with the Central region, offers the most favorable possibilities for the development of modern equipment production for the telecommunica-

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[70] Statistical cluster analysis was used for singling out the commodity groups that possess a significant import substitution potential in the sector. All the 6-digit commodity groups were divided into three clusters according to volume of imports into Russia. The first cluster is interpreted as product groups possessing substantial possibilities for creating import-substituting production in Russia. These product groups are presented in the Table "Potential for import substitution."

[71] Source: OECD, International Trade by Commodities Statistics ITCS.

tion sector due to the available production infrastructure and skilled personnel.

Table 7.5 Potential of Import Substitution by 6-digit Groups, HS system, data of the year 1999.

HS #	Products	Russia's share in OECD Exports	OECD Exports to Russia, million US dollars	Total OECD Exports, million US dollars	Russian Trade Balance, million US dollars
852520	Transmission apparatus, for radio-telephony incorporating reception apparatus	0.54%	220	41,023	-215
851790	Parts of electrical apparatus for line telephone or line telegraphy	0.56%	121.7	21,868	-118.7
852810	Television receivers including video monitors & video projectors, color	0.57%	93.3	16,440	-92.1
851730	Telephonic or telegraphic switching apparatus	1.05%	73.6	6,990	-68.3
854011	Cathode-ray television picture tubes, inc video monitor tubes, color	0.87%	49.2	5,670	-49.1

Source: OECD, International Trade by Commodities Statistics ITCS

At present, there are examples of telecommunication equipment manufacturing in the Northwest that have taken advantage of the above facts. The company NEC, together with the Telecominvest holding, have established NEC Neva Communication Systems, which manufactures digital exchanges. Lucent Technologies has set up a factory to manufacture switching equipment. Further growth in telecommunications and an associated increase in imports in the short to medium term is easy to envision. Although additional opportunities exist that are related to increasing returns to scale for domestic manufacturing, this will not lead to investments to exploit these opportunities unless some more commitment and effort is made by industrial policy-makers and the government, in order to create or upgrade the necessary infrastructure and dismantle the barriers for trade and development.

The Cluster System

History and Evolution

Telecommunications were introduced to Russia in the mid 19th century, after a decision to order the installation of the telegraph from the

Germans was made by the Russian Tsar. Soon after that decision, the first telegraph line from St. Petersburg to the military base in Kronstadt was built.

The history of electrical engineering in the Northwest began with the creation of the Chief Telegraph Workshop by Siemens and Halske, which was opened in the summer of 1853 in St. Petersburg. Rapidly increasing domestic demand led to the development of this industry in Russia. By the early 20th century, there were a total of 19 electric engineering plants in St. Petersburg alone.

Starting from this period, the Northwest has always been a leader in telecommunication technology development. The first telephone network was also introduced in Russia in St. Petersburg in 1879. It was in St. Petersburg where Popov invented the radio in 1885. The first TV set in the world was also built here in 1911, as well as the first color TV in Russia in the late 1950s. One of the key reasons for such leadership was the accumulated skills and commitment of the government, as well as traditions developed by the concentration of the activities in one location - St. Petersburg.

In the period from 1950 to 1960 a considerable diffusion of electronic engineering and electronics took place in the Northwest. In Novgorod, several electronics plants were created, all of which were closely related to the Leningrad-based enterprises and specialized in manufacturing TV sets, electronics and network equipment. In Pskov, the production of equipment for long-distance telephony was created.

Within the framework of the state planning policy, large investments were made in telecommunication equipment manufacturing in the Northwest in the 1970s - 1980s. A scientific and industrial complex was developed on the basis of existing and new production facilities and specialized scientific research institutes and higher schools. In the late 1980s, more than 50 industrial enterprises and scientific research organizations were operating in the area ofelectronics in St. Petersburg alone.

During the 1990s, radical changes took place in the sector. The collapse of the Soviet Union led to the destruction of user-producer networks, which connected organizations from the Northwest with partners all over the Soviet Union and Eastern Europe. The local producers were exposed to open market competition and lost markets in many product groups. This led to a decline in production and technology development. The timing of these changes were unfortunate as, in the same period, the leading nations of the world were committing ever-increasing investments to the rapid technological breakthroughs in this industry.

Cluster Sub-sectors

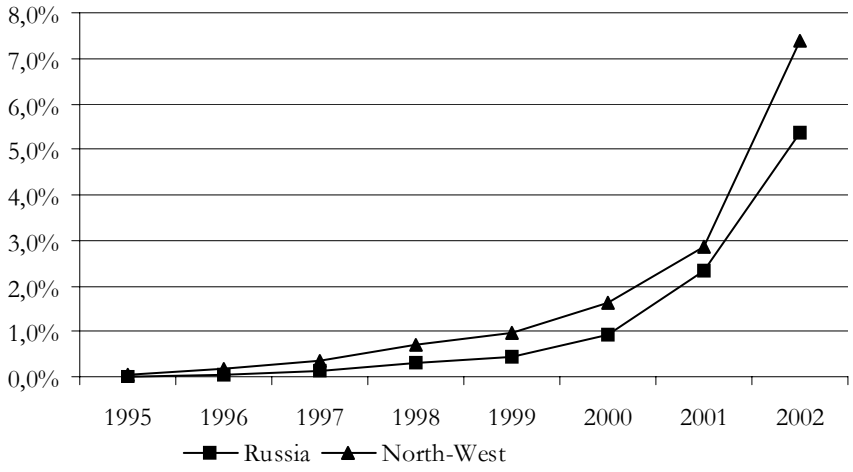
The following sub-sectors of the Northwest Russia ICT cluster may be outlined:

- Cellular communications
- Wire communications
- Production of telecommunication equipment
- Information technologies
- Science and education

Cellular Communications

The Northwest of Russia took the lead in mobile telecommunication development when Delta Telecom started the first mobile network in 1991. The service quickly became popular and, soon after this, two other companies, St. Petersburg Telecom and Northwest GSM, started their operations in St. Petersburg.

Figure 7.2 Dynamics of the Penetration of Cellular Services.

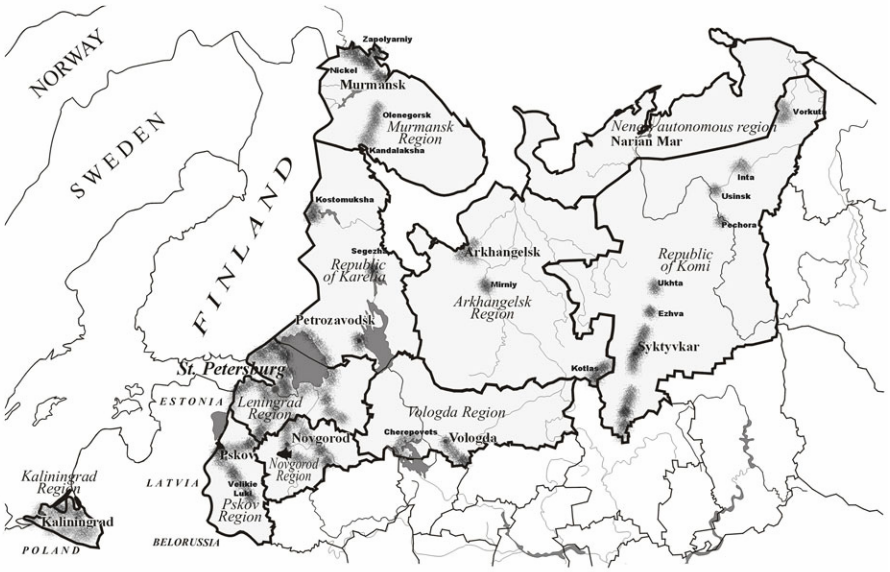


Source: Sotovik.ru, Goskomstat

The recent popularity of wireless communications has been stimulated by the rapid development and spread of the GSM standard worldwide. Intensive competition between leading international equipment manufactures has led to substantial reduction in prices for equipment and eased investment.

Cellular communications began here much earlier than in other regions of Russia. This is one of the reasons for the much higher penetration rates. Until 2001, however, the Northwest lagged behind in its growth rate, in comparison with the Russian average, due to the lack of competition (contrary, for example, to Moscow). Only at the end of 2001 did the second GSM operator (MTS, Moscow) started its operations in St. Petersburg, and announced that eventually the service would be offered all over the Northwest, as well. This obviously intensified competition and has already resulted in lower prices and booming sales[72].

Figure 7.3 GSM Coverage in the Northwest.



By the beginning of 2002, 7.4% of the total population in the Northwest already used cellular telephones. This is a very small amount compared to the usage rate in developed countries. GSM coverage in the Northwest is also far from satisfactory, as not all populated areas are covered. It is hard to expect better GSM coverage in the Northwest, because of the substantial investments required to increase coverage of areas with very low sales potential, due to their low population density. Therefore, it is feasible that there is room for the development

[72] During the first two months of MTS operations in St. Petersburg, the number of cellular subscribers in St. Petersburg increased by 52%.

and implementation of new technologies compatible with GSM or other modern standards, and suitable for covering large rural areas[73]. The Northwest could be a test field for this new standard, which could potentially have markets all over Russia, and also in many other areas with low population density in the world.

The Megafon[74] project by Telecominvest could be important for ICT development in the Northwest. Telecominvest is planning to use local technologies and know-how in this project. For example, the billing systems are supplied by the St. Petersburg-based Peterservice. Participation of the local suppliers in a Russia-wide project could facilitate user-producer relations and lead to sophisticated advantages for both suppliers and telecommunication companies in the region.

Wire Communications

Today, wire operators in the Northwest can be grouped into two substantially different categories: traditional and the new, created after 1990. Traditional operators are former state communication companies owned by the state-controlled holding company Svyazinvest. Other companies created after the start of reforms are private, and focus mostly on the new and higher value added services, such as mobile communications, digital telephony for business customers, and data transmission.

The existing telecommunication networks of traditional operators were designed and built in the Soviet period. Therefore, the currently operating equipment is largely worn-out and outdated in these companies. Low revenues per client have resulted in a minor upgrading in the recent years. In PTS[75], for example, the share of digital telephone exchanges does not exceed 28%. The main factor hindering investment in these companies is state tariff regulation, which forces traditional companies to sell their services below their costs. On the other hand, their monopoly position never motivated them to increase the efficiency and the competitiveness of their services.

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[73] The lower frequency standards GSM 400/900/1800 or CDMA 450 could be considered.

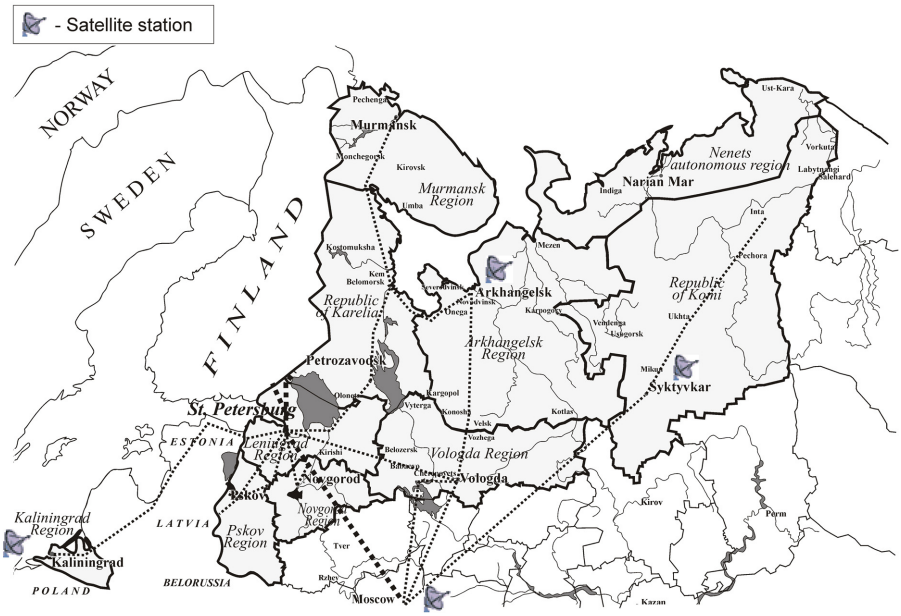
[74] Megafon is an all-Russia GSM project launched by Sonera, Telia, Telecominvest and CT-Mobile. At the beginning of 2002, Megafon acquired GSM licenses for 100% of the Russian territory. The Telecominvest holding includes 32 telecommunication firms.

[75] PTS is a traditional wire communications operator located in St. Petersburg . It is the largest wire communications provider in the Northwest, with an installed network capacity of 1.9 million lines.

As a positive tendency, one could point to the planned introduction of time-based charges instead of the fixed monthly payments. All regional traditional operators in the Northwest are merged into St. Petersburg PTS (the largest traditional operator in the Northwest). This might help traditional companies to attract investments and concurrently upgrade networks and introduce new services. The planned modernization could create a substantial demand for local equipment manufacturers. This is important as a factor motivating the upgrading, investment in product development and startups, and manufacturing subsidiaries for the multinationals.

One of the fastest developing sectors in ICT is data transmission and provision of access to the Internet. Unfortunately, there are some basic obstacles to their further development. First of all, the infrastructure does not meet quality and efficiency requirements. Russia is still a land of analog exchanges[76] and older generation technologies. Since 97% of the Russian Internet users have a dial-up access, the quality of communications infrastructure imposes significant restraints on the development of the Internet and its further penetration.

Figure 7.4 Data Transmission Networks in the Northwest.



[76] According to the Ministry for Communication and Informatization, the digitalization level of telephone networks is only 26%.

The Northwest has a well-developed data transmission infrastructure compared with other Russian regions. There are several long-haul optical fiber channels that run through St. Petersburg. Because of these channels St. Petersburg is one of the largest hubs connecting Moscow (the largest market and concentrator of domestic traffic) with the state-of-the-art communication networks of Finland. St. Petersburg has a well-developed local optical fiber network, as well. This creates positive conditions for active development of broadband Internet access in this location. Available services on the market (ADSL access, dedicated channels of medium and high traffic capacity) make quality access to the Internet possible for both corporate and private users in St. Petersburg. Unfortunately, the architecture of the telecommunication networks created in the Soviet period for the interregional traffic in the Northwest partly goes through Moscow. This represents additional difficulties, and integrating wire communications in the Northwest will require time and effort.

Manufacture of Telecommunication Equipment

In the Soviet period, the Northwest, and St. Petersburg in particular, became the center of development and production of industrial and consumer electronics. Substantial investments were made in electronic and telecommunications engineering. One of the areas in which significant efforts were concentrated was the manufacture of military applications. The large science and production associations were founded with headquarters in St. Petersburg. They are Krasnaya Zarya (telecommunications equipment), Svetlana (microelectronics vacuum tubes and valves) and Pozitron (TV equipment).

According to the regional industrial development approach used by the Soviet planning organizations, specialized education and scientific research organizations were integrated into manufacturing companies. As a result, the Northwest had a high concentration of specialized R&D and higher education facilities. The main R&D companies were the NII[77] Radio, which provided research and development in the field of radio communications, NII Sviazy, that conducted research and development in telephone communications, and Gyprosvyaz, which designed almost a half of the communication networks in Russia. The institutions of higher learning of the city, such as the St. Petersburg Bonch-Bruevich University of Communications, the Military Academy of Communications, the St. Petersburg Technical University and the

[77] NII is a widely used Russian abbreviation meaning Scientific Research Institute.

St. Petersburg Electro-Technical University provided specialists to the enterprises and scientific research institutes of this industry.

These sophisticated science and production associations suffered greatly during the period of perestroika and the break-up of the Soviet Union. They lost their affiliates in the parts of the Soviet Union which became independent countries and introduced trade barriers, and they also lost a majority of their clients and suppliers because of changes in allocation from state planning to the market-based economy resulting from the reforms. For example, out of the large science and production association Krasnaya Zarya, which supplied almost the whole Soviet Union with exchange equipment, only the head company in St. Petersburg remained.

The world's booming information and telecommunication technologies markets in the late 90s spread into Russia. The mobile communications, data transmission, Internet access and other modern services were launched here as well. Local producers were completely overwhelmed by the international competitors that offered breakthrough solutions with ever-increasing speed. In these circumstances, the local producers concentrated on specialized equipment and software. The new startups and spin-offs from the old companies, dating from the Soviet period, had no problems hiring professional technical specialists that were leaving the R&D companies and plants.

The growth of the final demand for telecommunication services and, above all, for mobile communications, led to investments and corresponding growth in demand for telecommunication equipment. This increase in demand, together with the remaining educational and research infrastructure and inherited industrial capital, creates pre-conditions for the gradual recovery in ICT equipment production in the Northwest. This could serve not only the needs of the domestic market through import substitution and new products, but also add substantially to exports from the Northwest due to the lower costs and more sophisticated skills advantages in this location.

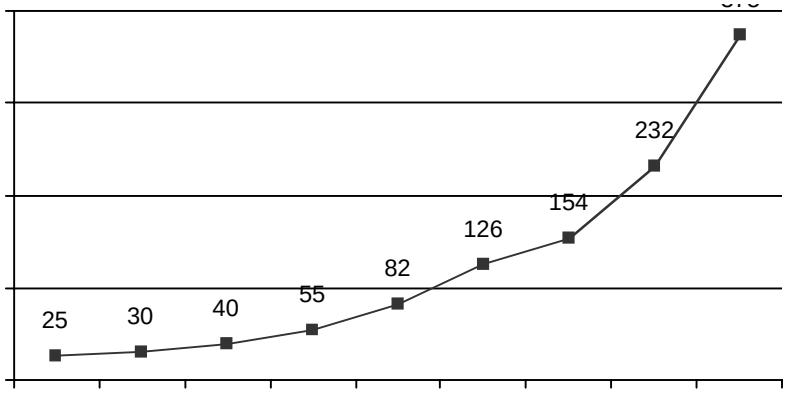
Information Technologies

Software development is one of the most productive and rapidly growing sectors of the Russian economy. In 2000, labor productivity in Russia was 38% of the productivity level in the USA, whereas the average level in Russia was 18% of that in US, and in project programming, as high as 72% of the same index in the USA[78]. St. Petersburg is one of

[78] McKinsey Global Institute, "Unlocking Economic Growth in Russia," 2000.

three main centers for software development in Russia (Moscow and Novosibirsk are the other two).

Figure 7.5 The Russian Offshore Programming Market, million US dollars.



Source: Market-Visio/EDC, 2002

The main factor underlying the success of St. Petersburg in information technologies is its highly-developed system of education. Specialists for the IT sector are trained in many schools of higher education in St. Petersburg. The following five are the leading Universities:

- State University,
- Technical University,
- Electro-Technical University,
- State University for Aerospace Instrumentation,
- State Institute of Fine Mechanics and Optics.

The high educational level of St. Petersburg universities is regularly confirmed in international contests. At the prestigious International Programming Contest (March 2001. Vancouver, Canada) the teams from St. Petersburg State University and St. Petersburg State Institute of Fine Mechanics and Optics won the first and the third places respectively.

Many IT companies appeared in St. Petersburg during the 90s, to take advantage of its qualified easily available labor force. The leaders can be distinguished as those who employ more then 100 programmers. They are the Lanit-Tercom, Arcadia, Polikom Pro, etc.

The significance of the Northwest in IT is also confirmed by the fact that a number of well-known international companies have opened

software development centers in St. Petersburg. In 1997, the Motorola Company opened a development center in St. Petersburg. The R&D department of Lucent Technologies has successfully operated in St. Petersburg for some time already.

The local IT sector has been closely involved in the development of telecommunications market. A number of companies in St. Petersburg have developed software for both equipment manufacturers and networks operators (e.g. billing systems). This creates links for the IT companies as essential suppliers, both for equipment production and telecommunications. At present, telecommunications companies are among the largest domestic consumers of software.

Science and Education

The system of education in the Northwest has suffered less dramatically during the transition period. Nevertheless, many institutes of higher learning were able to adjust their curriculum to market demand and, at present, provide an increasing number of students (under- and post-graduate) with internationally competitive training.

The development of IT in the region has created a considerable demand for qualified personnel. There is a substantial initial inflow of professionals from the basic sciences that find more opportunities for work in this area. At present, the technical institutes of the Northwest train up to 3,000 programmers annually, of which about 1,000 receive a prestigious and internationally recognized education at the most renowned schools[79]. This inflow of professionals and the developing business infrastructure have allowed St. Petersburg to become the leading Russian center of offshore programming.

Higher educational facilities that specialize in communications have also reviewed their educational curriculum and offer students a better education that fits the requirements of the rapidly developing domestic telecommunications industry. The availability of well-trained personnel and the concentration of the communications business in St. Petersburg (the merger of the regional Northwest wire operators with PTS/MMT, the Megafon project, etc.), leads to a further specialization and concentration of knowledge and skill-based activities in this city[80].

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[79] These are St. Petersburg State University, St. Petersburg State Institute of Fine Mechanics and Optics, St. Petersburg State Technical University, St. Petersburg Electro-Technical University and St. Petersburg State University for Aerospace Instrumentation.

[80] These are mobile communications, digital telephony, data transmission, etc.

Research and development activity was forced to restructure substantially in the period of transition when demand and resource allocation shifted to open market mechanisms. The number of personnel involved in research and development dropped between 1992 and 1999 more than twice, and some scientific research institutes were closed. Nevertheless, those such as NII Radio, NII of Sviazy and Giprosvyaz survived; however, the volume of their R&D activity has substantially decreased. There are spin-off companies that rapidly develop due to better flexibility.

Primary Issues and Challenges for the Future

The ICT cluster in the Northwest of Russia is experiencing considerable growth today. The growth is fueled mainly by the substantial increase in final demand for telecommunication services. However, the background of the current progress of the cluster lies in the concentration in the Northwest of inherited capital, education and R&D. The availability of sophisticated human capital facilitates the growth of modern telecommunication and software companies.

A number of international, and in particular Finnish companies, have already taken advantage of opportunities for investing in the Northwest Russia ICT cluster. Sonera has been the main investor in the first GSM operator in the Northwest[81]. Later Sonera also invested in data transmission activity and constructed modern data transmission lines from Moscow via St. Petersburg to Finland. In 2001, Sonera became one of the main investors in the Megafon GSM project[82]. Elcoteq opened a plant in St. Petersburg, which now employs nearly 200 people.

On the other hand, the cluster is influenced by a number of negative factors, such as a lack of competition in the main segments of the telecommunications market and stagnation of the old ICT equipment manufacturers. Thus, a number of questions can be raised concerning future development:

- Is there a chance that the authorities will introduce transparent rules of the game in telecommunications (clear rules for

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[81] Sonera (at that time Telecom Finland) initiated the foundation of Northwest GSM in 1992.

[82] Megafon is a Federal Russian GSM project launched by Sonera, Telia, Telecominvest and CT-Mobile. At the beginning of 2002, Megafon had GSM licenses for 100% of the Russian territory.

obtaining GSM licenses, for connecting to basic wire networks) and thus increase investment attractiveness of the sector?

- Will a base for FDI in ICT equipment production be created to take advantage of available human and industrial capital in the Northwest?

The main expectations today are connected with industrial policy development. The Northwest of Russia is becoming an important agglomeration of the ICT, and offers good opportunities for further growth. There is substantial opportunity to increase light value added exports of equipment, components and sub-assemblies and software in this industry if a favorable investment and business climate is created. However, the lack of government regulation, industrial policy, and commitment restrains the growth and development of this industry today.

8 Construction Materials Industries

Russian statistics traditionally refers to construction materials as all product groups which are technologically similar to materials used in construction. Some of those, in practice, have no relation to construction materials at all, such as ground limestone used in agriculture, glass bottles, porcelain, etc. At the same time, carpentry products are considered part of wood-processing, wallpaper in pulp-and-paper, construction steel in metallurgy and metalworking, cables and electric appliances in machine-building, and paints and varnish in chemicals. These and other important products are not taken into account in Russian construction materials statistics. Therefore, analysis of the development of this sector is complicated and requires additional efforts and resources.

The Role in the Regional Economy

Construction materials manufacturing holds a stable position in the industrial production of the NWFD due to steady domestic demand for such products. In 1999, the share of construction materials was 2% of the total industrial output in the District. These industries were concentrated in the Pskov and Leningrad regions. The least important were the Murmansk region and Nenetsk Autonomous District.

Table 8.1 Relative Weight of the Construction Materials Industry in the General Industrial Structure of NWFD Regions in 1999, %.

NWFD	2.0	Republic of Komi	1.6
Pskov region	3.9	Arkhangelsk region	1.4
Leningrad region	3.2	Kaliningrad region	1.4
Novgorod region	2.5	Vologda region	0.9
St. Petersburg	2.3	Murmansk region	0.7
Republic of Karelia	2.1	Nenetsk District	0.1

Source: Goskomstat, Regions of Russia, 2000

St. Petersburg and the Leningrad region have been leading in recent years in the total production volume.

Sources of Raw Materials

The Northwest is rich in various resources that can be used by the construction materials industry.

The most important natural raw materials are

- Crystal rock stone (granite, diabase, quartzite, marble and others)
- Limestone
- Sand and sand-and-gravel materials
- Clays
- Gypsum
- Construction wood

The crystal rock stone is mined within the borders of the Baltic shield (Republic of Karelia, Murmansk and Leningrad regions), where these rocks lie near the ground surface. Stone raw materials often have decorative qualities (various kinds of granite, marble, diabase), sometimes unique, e.g. Shoksha quartzite in the south of Karelia and others. This material was and continues to be used in construction in St. Petersburg (elements of the buildings, facing of embankments, subway stations) and other towns in this area.

There are many deposits of limestone - a sedimentary rock - to the south of the Baltic shield. This easily-worked stone is also widely used in construction. The deposits of sand and sand-and-gravel materials are primarily connected with the glaciowater sedimentations, which are widespread in the Northwest. In addition, the sand from the sea bottom is mined in the District. Clays are also available in all the regions: both solid clays, used for making bricks, and plastic clays of different colors, of which mineral paints are produced. Gypsum is extracted along with limestone and clays.

The reserves of construction wood are mostly concentrated in the taiga zone: the Republics of Karelia and Komi, the Arkhangelsk, Vologda, Leningrad and Novgorod regions. The area covered with forests in these regions is on the average more than 50%. Coniferous species prevail. The wood resources of the district are the largest in the European part of Russia. Issues related to the products made of wood are considered in more detail in Chapter 3 of the present study.

There are rich reserves of all types of raw materials in the District. At present, the resources are only partly developed. The deposits close to railroads are used first. The open-pit method of extraction prevails.

The products of the other industries are another important source of raw materials for construction materials manufacturing, e.g. metallurgy (steelworks), oil refining (polymers), chemical industry and industrial wastes, especially from ore processing. Therefore, the concentration of construction manufacturing in certain locations is based on ties with other industries and substantial local demand.

Structure of the Sector

Until recently the construction materials industry of the Northwest has sold its products only on the domestic market. The quality, in most cases, lags behind international quality standards, and the poor products range and offerings (costs, delivery terms, etc.) still prevent the domestic manufacturers from successfully competing with international competitors on the world markets. On the domestic market, some products are less costly owing to lower transportation costs and quality requirements of consumers, however.

Builders represent the main market for construction materials. The domestic construction industry is undergoing a process of substantial change. Their volumes decreased from the beginning of the 1990s 4 to 5 times. In the structure of the gross regional product according to NWFD regions in 1999, the share of construction varied from 4.1% to 8.2%, depending on the region.

Table 8.2 The Share of Construction in the Gross Regional Product in NWFD Regions in 1999, %.

Republic of Komi	8.2	Republic of Karelia	5.6
Novgorod region	8.2	Kaliningrad region	5.0
Leningrad region	7.9	Pskov region	4.9
St. Petersburg	6.7	Arkhangelsk region	4.8
Vologda region	6.0	Murmansk region	4.1

Source: Goskomstat, Regions of Russia, 2000

The most important changes which are taking place in construction today are:

- The growing diversity of standards
- Decreased share of panel-housing construction (twice since 1993)

- Increased share of brick-and-stone buildings (50% from 1993)
- A growing share of renovation and repair (26% of construction contracts in 1998)
- Growth in country-house construction

These changes create new challenges for the construction materials industry, the most important of which are the necessity to improve quality and extend the range of products (in the Soviet period, the range of construction materials was simplified to meet the needs of centralized distribution).

In the total costs of the construction materials industry, more than 20% are energy costs. The share of energy in the total costs is especially large in cement and glass manufacturing and in the production of ceramic tiles. Energy costs are the most important single factor impacting the competitiveness of the sector, especially taking into consideration the fact (discussed in the energy cluster section in detail) that the energy tariffs will substantially increase after the electric energy market opens for competition.

Another important cost component is transport. First of all this results in a situation in which it is feasible to manufacture products with a low added value only for local consumption, due to high transport costs. The scale economies of producing construction materials with a higher added value require a larger market and are also to be shipped outside the region. This is where the high costs and low reliability of transport reduces their competitiveness substantially. As a result, their share in the total is small.

The prefabricated concrete and reinforced concrete elements prevail in value terms (about 38%), as well as wall materials (about 14%), cement (about 12%) and non-ore construction materials (about 9%) The recession in the construction materials industry, which began in the early 1990s, was overcome by the year 1998. In 1999, the growth of production was about 8%, but other industries were developing even faster, and the relative weight of the construction materials decreased further, from 2.4% in 1998 to 2% in 1999.

The largest volumes of construction in the Northwest were carried out in St. Petersburg and the Leningrad region.

Table 8.3 The Main Manufacturers.

Bricks, ceramic tiles	Pobeda – Knauf, Keramika (together – 85% of the wall and facade ceramics market), Lenstroykeramika, Nefrit – Keramika
Sand, gravel	Lentekhstrom (60% of the market), Rudas (sea sand)
Stone, road-metal	Lenstroymaterialy, Vozrozhdeniye
Reinforced concrete products	Barrikada, Betomix, Metrobeton, NCC Petrobeton, 211th Plant of Reinforced Products
Cement, asphalt-and-concrete products	NCC Perspektiva, Asphalt and Concrete Plant # 1, Stroykomplekt, Glinozyom, Borovichi Plant of Construction materials (Novgorod region)
Steelworks	Plant Stroymetallkonstruktsia, Tolmachevsky Plant of Reinforced Concrete and Metal Structures
Heat-insulating materials	Plant Penoplex (a part of Kirishinefteorgsintez - oil processing plant) – 50% of the heat-insulating slabs market, Fleiderer-Chudovo (Novgorod region), Plastprom (Pskov region)
Hydro-insulating and roofing materials	Plant Izoflex (a part of Kirishinefteorgsintez), Euroline, Rannila Steel
Dry construction mixtures	Kreps, Petromix
Adhesive materials	Henkel – Era
Paints and varnishes	Pigment, Finncolor, Teks
Building glass	Glass works in Pushkin (a district of St. Petersburg)
Building carpentry products and standard wooden houses	Solombalsky LDK (Arkhangelsk region), Sokolsky House Building Company, Ustyales (both are in Vologda region)

The local market for certain products is practically monopolized (for example, gypsum-carton sheets are only produced by the KNAUF company).

In connection with structural changes in construction, there is an opportunity for more local manufacturing of the following products

- glass,
- insulating (thermal, hydro- and sound-) and roofing materials,
- various finishing materials (especially wallpaper, floor covering, etc.),
- dry construction mixtures,
- adhesive materials.

These products have to be partly imported from the other regions of Russia, and from abroad. It is reasonable to establish the manufac-

ture of these products within the Northwest because of the obvious cost and scale advantages.

New investment opportunities include production (on the basis of existing enterprises) of the high quality thermo- and sound-insulating materials, ceramic bricks, roof tiling, indoor tiles. Two new glassworks have been built in Kirishi and Kingisepp (both in the Leningrad region).

The construction materials industry is characterized by a low concentration of production. Only two companies are rated among the 150 largest industrial companies of the Northwest according to the results of the year 2000. They are the Lenstroymaterialy (the only large holding, which, however, besides the construction materials manufacturing the other companies that have a larger relative weight) that occupies the 40th position and the Pobeda-Knauf, which is the 148th in this ranking. The labor productivity at these enterprises is 480,000 and 509,000 rubles/person respectively, which is lower than at the majority of large companies in other branches of industry. Their profit margins differ. They are 5.4% at Lenstroymaterialy and 23.2% at Pobeda-Knauf, which is a joint venture with a German company.

Today, foreign capital has begun to be more active in this industry. This process intensified especially after the 1998, when the prices for imported goods rose sharply and it became more profitable to manufacture domestically.

The largest foreign investors in this sector today are

- Germany (Pobeda – Knauf, Fleiderer-Chudovo, Henkel – Era)
- Finland (Finncolor, Betomix, Euroline)
- Sweden (NCC Petrobeton, NCC Perspektiva).

These are joint ventures which have acquired up-to-date, imported technologies and equipment, and marketing skills that are the most advanced in the industry. On the other hand, Russian enterprises (all privatized) are also importing technologies, but not skills, which complicates their development in many cases.

Notwithstanding the above changes, the share of technologically advanced products in the total production output is still very low.

Despite the competition between local manufacturers, which has become tougher during recent years, the market is far from perfect. There is still a lot of protectionism with regard to specific manufacturers from local authorities. A more rapid development of competi-

tion, and, consequently, increase in the manufacture of high quality products requires changes in government policy and approach.

In the main product groups, such as cement, window and polished glass, roofing, wall materials, etc, the share of domestic products reaches 95-99% of the total. On the other hand, in high value added product groups used in better quality construction, i.e. floor materials, ceramic tiles, sanitary ceramics etc., the share of imports is high.

Production of stone has experienced difficult times in recent years; many quarries were abandoned. The quarrying at the remaining ones was considerably reduced, due to drawbacks in efficiency and fluctuations in demand. Domestic paint and varnish manufacturers have obsolete technologies and facilities and, in general, are stagnating. For example, Pigment, which was rated 94th among the 150 largest companies (by sales) in the Northwest in 1999, and occupied about 3% of the Russian market, has lost its position after restructuring and has not appeared among the 150 largest in 2000.

There is a well-developed system of education in the Northwest represented by the Academy of Engineering and Construction (St. Petersburg), specialized technical schools and colleges in St. Petersburg, Petrozavodsk, Syktyvkar, Pskov, Velikiye Luki and other towns. The R& D is concentrated in St. Petersburg.

Primary Issues and Challenges for the Future

Considerable structural changes in construction and a growing demand on the domestic market are the most important incentives for industry modernization. However, competitive markets have appeared in very few segments thus far, despite the comparatively low obstacles for entering the business.

The most important current trends in the development of the industry are:

- Reorientation and scaling of regional production capacity in proportion to the local and domestic market size;
- Diversification and increasing flexibility in meeting customer demands;
- Vertical integration (integration of materials manufacturing into building);
- Imports of equipment and technologies.

The construction materials industry of the Northwest is striving to dominate in many segments of the domestic market. Successful import substitution development in the high value added segments requires that answers to the following questions be found:

- What measures are necessary for increasing investment in this area?
- How will the local manufacturers and suppliers networks develop?
- What are the measures for improving user-producer cooperation?

9 Transport and Logistics

History

Development of the transport system in the Northwest Russia has closely followed the overall political and economic development of the Russian state. In the Novgorod period (before 15th century) the main flows of freight by inland waterways headed towards Great Novgorod and further on - by the Baltic Sea to Europe. In 16th - 17th centuries, Muscovy lost its access to the Baltic Sea, and therefore the main trade with western countries went through the north - via Sukhona, Severnaya Dvina river, and the main sea port of that time, Arkhangelsk (built in 1584).

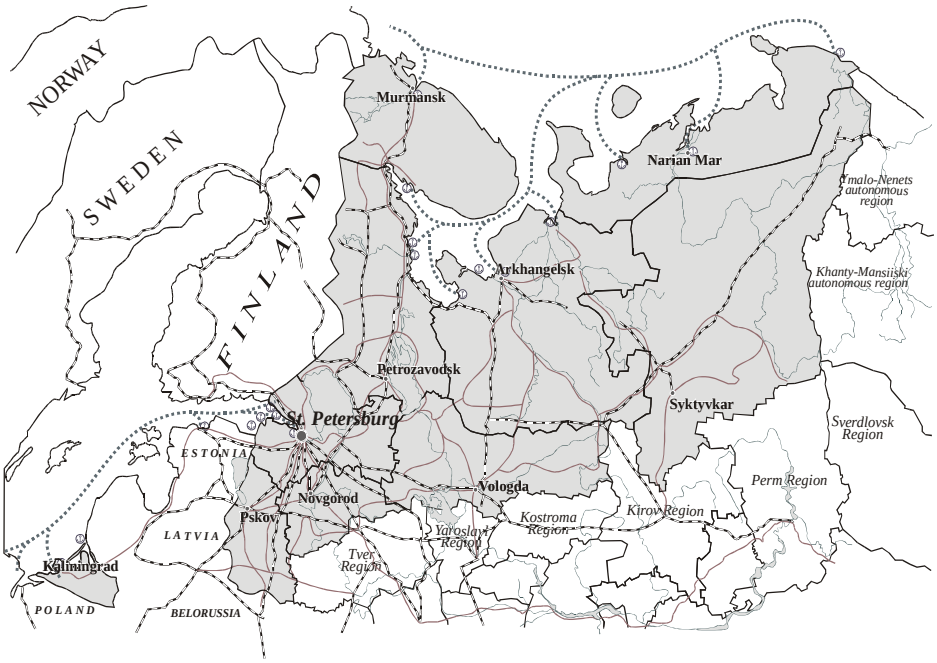
In the 18th century, during the reign of Peter the Great, Russia re-gained its access to the Baltic Sea, and St. Petersburg (founded in 1703) acquired the functions of the main seaport of the country. In late 19t - early 20th centuries, active construction of railroads took place in the country. Railroad transportation supplemented, and to a large extent, replaced traditional waterways in the Northwest Russia. In the same period, the ice-free port of Murmansk was built at the Barents Sea.

During the Soviet period, new railroads were laid (Konosha – Kotlas – Vorkuta, West-Karelian and others), a network of highways with hard surface appeared, and new types of transport - aviation and pipelines - began developing. The Volgo-Balt and Byelomorsko-Baltijsky canals connected the inland waterways and basins of seas surrounding Russia in the North, Northwest and South.

During this period, the transport system of the Northwest Russia was closely connected with the arterial roads and terminals of the Baltic states, which caused many difficulties after the break-up of the USSR.

St. Petersburg is the largest node and gate to the global networks in the Northwest of Russia. This city is the main sea and river port, the key railroad and highway junction, and the largest airport in the Northwest Russia. The role of St. Petersburg and surrounding areas in the near future will grow, as new projects are implementated (ports in Primorsk and Ust-Luga, freight airport in Veschevo, new railroad station). St. Petersburg is also the center of telecommunications in the Northwest Russia.

Figure 9.1 Railroads, Roads and Water Routes in the Northwest of Russia.



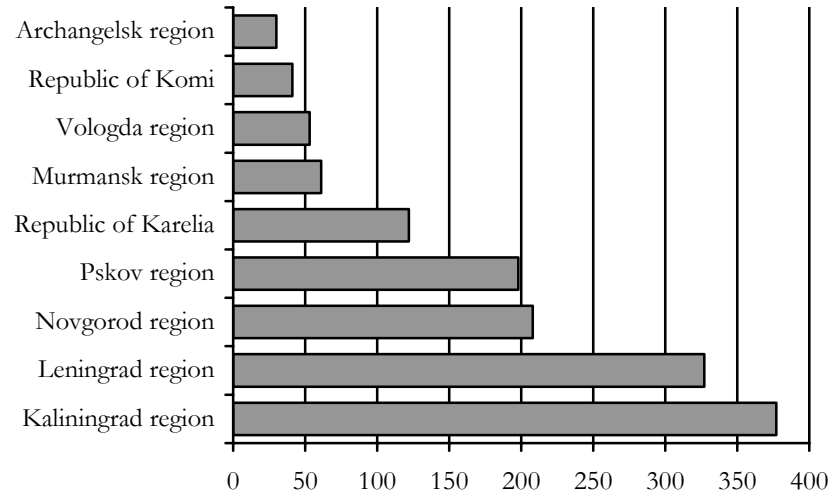
The other large sea ports, Murmansk, Arkhangelsk and Kaliningrad, are the secondary transportation nodes. The port in Kaliningrad is isolated from the national Russian networks by the territories of the Baltic countries; its further operation is in question due to political factors. There are also less significant transportation nodes in this area. They are Cherepovetz, Petrozavodsk and Kotlas (important railroad and river junction), Uhta and Kirishi (pipeline junctions).

Railroad Transport

The total length of railroads in the Northwest Russia is about 13 thousand km today. Their density varies greatly by region: the highest density is in the Southwest regions and the lowest in the North and in the Northeast –(the main locations for raw material resources). There are no railroads in the Nenetsk District.

The railroad is the most important means of transportation in the district and provides up to 70% of the total freight traffic. The heaviest traffic goes through the main railroads that connect the Kola Peninsula and the Republic of Komi with the South, St. Petersburg and Moscow and Finland. The largest railroad junction is located in St. Petersburg, where 10 railroads of federal importance intersect.

Figure 9.2 The Density of Railroads of General Use, km per 10 thousand sq km of the territory.



Source: Goskomstat, Transport and Communication in Russia, 1999

Most of the bulk freights, i.e. bituminous coal, oil, petroleum products, ore, metal, building materials, lumber, cellulose, fertilizers and grain, are transported by rail. Container transportation makes up less than 1% of the total volume of freight traffic.

Among the different regions of NWFD, the biggest shipments by railroad transport originate from the Leningrad and Murmansk regions, and the Republic of Komi.

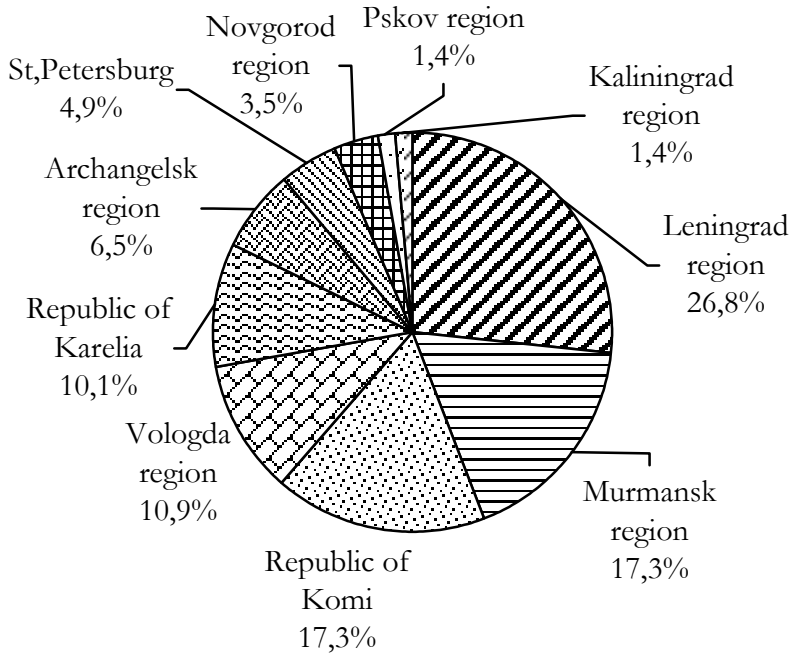
Railroad transport carries about 40% of passengers on inter-city lines, about 30% on suburban lines and less than 8% on international lines.

Railroad transport is still a state-owned monopoly, where tariffs and investments are regulated by the state. In the Northwest Russia it is represented by the Oktybrskaya Railroads, which is operated under the supervision of the Ministry for Transport. During the economic recession in the 1990s, freight traffic, as well as freight turnover, decreased on average by 10% a year. At the same time tariffs rose steadily. Prices for passenger traffic appreciated faster than for freight.

As a result, of substantial under-investment in the fixed capital most rolling stock was fully depreciated and not replaced. The local production of locomotives and railroad cars dropped on average by 4 to 5 times, in comparison with 1990. The import of railroad equip-

ment has also sharply decreased during the last decade. The most acute problem today is the absence of railroad cars for various specialized shipments. The overall unreliability of the railroad makes it impossible to implement the just-in-time (JIT) manufacturing systems in the region. This reduces substantially the potential competitiveness of domestic manufacturing and the scope of possible participation of foreign investors in export-oriented manufacturing in this region.

Figure 9.3 Freight Shipped by Railroad in 2000, %.



Source: Goskomstat, Transport and Communication in Russia, 2001

The overall condition of railroads is also poor; over 20% of railroad tracks need to be replaced. Due to frequent repairs, the train schedules are often disrupted. Because of the monopolist position, the management of the railroad remains grossly inefficient. This leads to higher costs of Russian goods. The Oktyabrskaya Railroads tries to compensate low returns in freight traffic by the growth in tariffs, which is carried out in conditions of decreasing reliability and often worsening operational quality of this type of transport.

Sea Transport

The largest seaports of the Northwest Russia are:

- St. Petersburg – dry freight (freight turnover in 2000 – about 30 million metric tons)
- Murmansk – fishing and the base of the Northern Sea way
- Arkhangelsk – lumber and wood products (freight turnover in 2000 – about 14 million metric tons)
- Kaliningrad – fishing.

Out of these ports only Murmansk and Kaliningrad do not freeze all the year round. However, it is difficult to use them due to the long distance from these ports to major markets and production concentrations in Russia.

There are also smaller ports operating in the Northwest Russia. They are the Kandalaksha, Byelomorsk, Kem and Onega on the White Sea, and Vysotsk, Vyborg and Lomonosov on the Baltic Sea. However, their contribution in the total freight turnover is small. There are several ports (Severomorsk, Gremikha and others), that are only used by the Navy and do not receive civil vessels.

The existing ports (except Murmansk) are not deep enough (less than 15 m) for receiving modern large capacity vessels. Their facilities need reconstruction and modernization. The domestic demand for sea transport exceeds the total available capacity of ports in the Northwest Russia. According to estimates of Russian experts, there could be 2 to 3 times more capacity to accommodate existing demand. In addition, the domestic ports do not meet the quality and service requirements, in particular specialized terminals for oil, chemicals, containers, pulp and paper, etc. Therefore, the cost competitive facilities located in the nearby countries (Finland, Estonia, Latvia) are likely to sustain their position, notwithstanding an overall drive in Russia to be self-sufficient in these terms.

Two new specialized ports are being constructed in the Leningrad region. They are an oil port in Primorsk and a bulk dry-freight port (for coal, ore, metals and fertilizers) in Ust-Luga (with an estimated freight turnover of 35 million metric tons). They are expected to receive flows of freight, which run via the Baltic states now, and to release the St. Petersburg port for freight in containers and refrigerators. The Primorsk port is considered the most promising one. It is designed to handle up to 12 million metric tons of oil annually.

At the same time, the new ports, according to the estimations of the World Bank and the European Bank for Reconstruction and Development, will not be profitable. They will face strong competition from the unfreezing Baltic ports, which have recently been actively modernizing in view of their great importance for the economies of these countries. In addition, the largest oil companies are striving for the creation of their own terminals: LUKoil is actively building an oil port in Varandei Bay in Nenetsk District and Surgutneftegaz plans to build a terminal for oil products in Batareinaya Bay in the Gulf of Finland.

Commercial sea transport is almost fully private. The largest companies are the Baltic, Murmansk and Northern (Arkhangelsk) Shipping Companies, as well as some river shipping companies participating in the coastal trade.

During the past decade, these companies have lost (through insolvency) many of their ships, and out of the remaining ones 60% are more than 15 year old, which limits their use in international navigation. There are fewer than 5% of new commercial sea vessels that are less then 5 years old.

Shipbuilding in the Northwest Russia is also in disarray in regard to the building of civil vessels. It is hard to identify competitive new products that the Northwest Russian shipyards can offer to local shipping companies, although it is necessary to mention that there is still a potential for success, if solutions can be found. Due to numerous structural problems related to privatization, outdated and inefficient facilities and vessels inherited from the Soviet period, domestic, and Northwest shipping companies in particular, are still in poor shape, and desperately short of capital investments.

As a result of the decline in domestic shipping, in comparison with the year 1990, freight turnover by domestic vessels decreased by 4 times, and 90% of international trade is now handled by the foreign charterers.

Passenger transportation by sea has dropped 20 times during the past decade and is quite negligible.

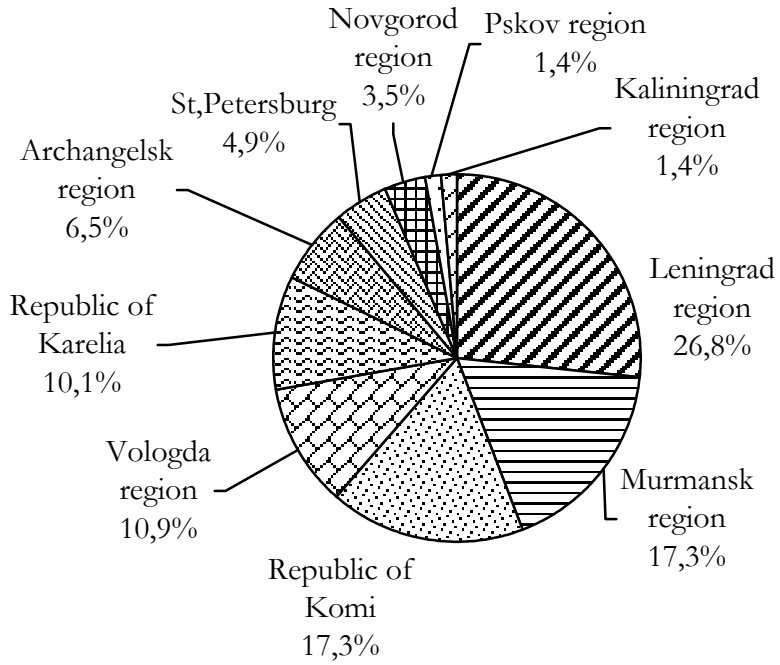
Inland Water Transport

The total length of inland waterways suitable for navigation in the Northwest Russia is about 15 thousand km. The most important waterways are the rivers of Severnaya Dvina, Sukhona and Vychegda, Pechora, Onega, Neman (Kaliningrad region) and the Neva system, i.e. Lake Ladoga, Svir river, Lake Onega, Volgo-Baltic and Byelomor-Baltic canals.

River transportation is, on the average, three times cheaper than railroad transport. Unfortunately, it has some shortcomings - low speed, low flexibility as far as the routes are concerned, limited period of navigation, etc.

The main freights carried by waterways are building materials and lumber (for both these items, this type of transport is second in importance after railroad transport, in volume of freight traffic). Lumber-rafting is primarily done on the northern rivers of Severnaya Dvina, Pechora and Onega.

Figure 9.4 Freight Shipped by Inland Water Transport of General Use in 1998, %.



Source: Goskomstat, Transport and Communication in Russia (1999)

The inland waterways are served by private companies: the Northwest, Byelomor-Onega and Pechora River Shipping companies. Their vessels are also inefficient and outdated. The majority of port and other related facilities have been used for more than 40 years, and also need substantial reconstruction and upgrading.

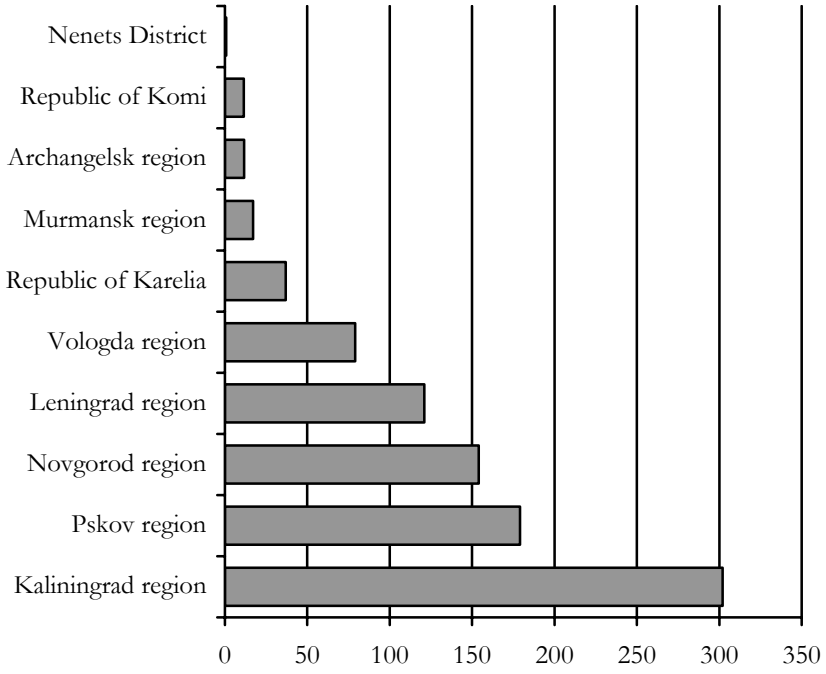
The river transport freight turnover decreased more than threefold in the period from 1990 to 1998, and its passenger turnover, decreased

sixfold. The biggest volume of shipping by inland water transport comes from the Vologda and Leningrad regions.

Motor-vehicle Transport

The total length of highways with hard covering in the NWFD is about 86 thousand km. However, the overwhelming majority of these roads do not conform to international technical norms, including load per axle limits.[83] As a result, the use of modern, cost efficient vehicles is not possible and isrestricted by law.

Figure 9.5 Density of Highways of General Use with Hard Covering, km of roads per 1000 sq km of the territory.



Source: Goskomstat, Transport and Communication in Russia (1999)

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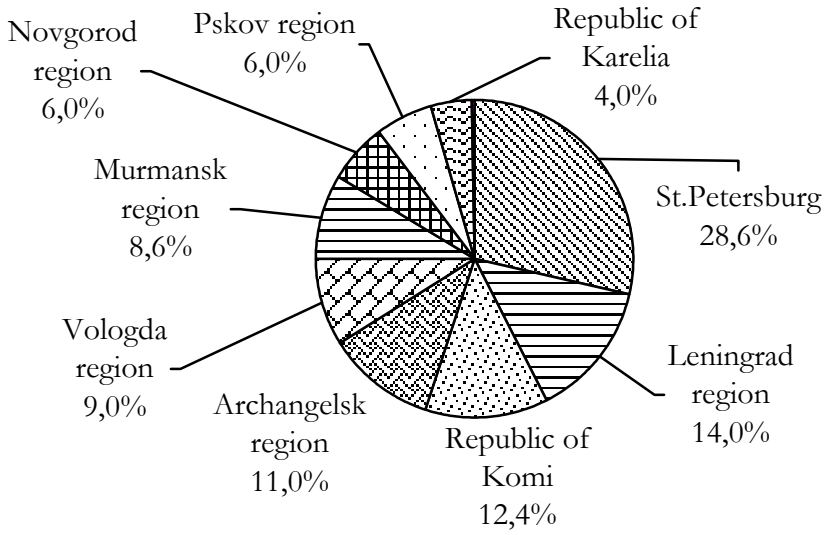
[83] There is a 20-ton per axis limitation on carrying capacity in Russia, while in the Western countries this limitation is 40 ton per axis.

[85] The share of domestic companies in international transportation is deplorable.

The density of highways with hard surface is comparatively high only in the Southwest of the District, while in the North and Northeast it is very low. Many villages are still far away from such roads.

During the past decade freight traffic by motor transport decreased by five times. By the volume of freight transportation, motor transport is five times smaller than railroad transport. St. Petersburg, the Leningrad region and the Republic of Komi have the largest volume of road transportation among the other regions of the NWFD.

Figure 9.6 Freight Transportation by Large- and Medium-sized Motor Transport Companies in 2000, %.



Source: Goskomstat, Transport and Communication in Russia, 1999

Motor transport mainly provides for intra-regional transportation; its role on the inter-regional, and especially on the international level is insignificant (TIR CARNET freights are important in over-the-border trade and transit traffic between Russia and Finland).

In passenger transportation on the inter-city and suburban routes motor transport, on the contrary, has the leading position, and on international lines, it lags behind only airline service. In intra-city transportation (except St. Petersburg) buses also hold the dominant position.

Private companies prevail in freight transportation (about 90%), while in public transport the share of private companies is much smaller (about 15%).

The growth of tariffs for freight transportation by motor transport exceeded the tariff growth rate for railroad transport in the 1990s, which was largely dependent on fuel prices.

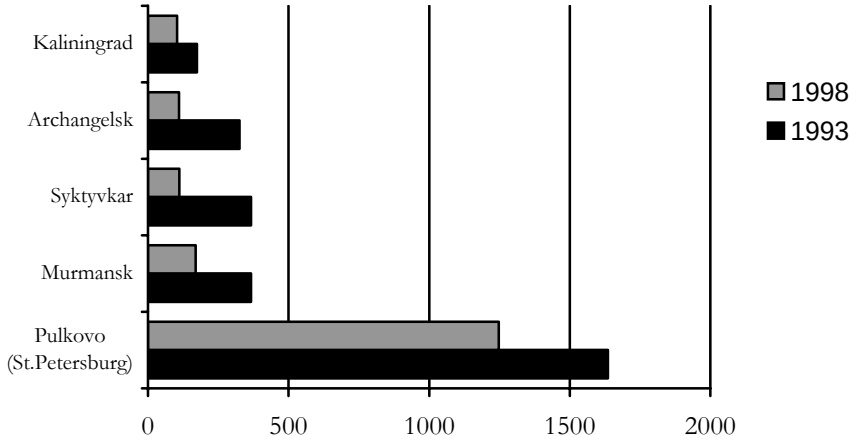
The renewal of motor vehicles goes more rapidly than that of other means of transport. This type of transport business develops relatively quickly. Nevertheless, about one-third of trucks and buses have been used for more than 10 years and need to be replaced. Vehicles of local make are, in most cases, inferior in quality to their foreign counterparts. Their production has sharply decreased due to low demand (the output of trucks by five times). Some types of specialized vehicles are not produced in Russia at all.

Motor transport development in the NWFD is difficult due to severe climate conditions and requires a state program of road networks development.

Air Transport

Airfreight traffic decreased in the 1990s by four times. The use of aviation in agriculture, forestry and aerotopography, etc. decreased even more (by 10 to 15 times). Domestic carriers rapidly lost their share in airfreight to international companies, i.e. half of the transportation is carried out by international lines, and their share tends to grow. There are also positive developments in this industry. A new international freight airport is being built in the Leningrad region (Veshchevo near town of Vyborg).

Figure 9.7 The Number of Passengers Traveling by Air from the Largest Airports, thousand people.



Source: Goskomstat, Transport and Communication, 1999

Passenger traffic by air decreased by four times. This is especially damaging for domestic airlines that had their largest share in revenues from domestic traffic. Air transport still plays the leading role in international transportation. The number of passengers that crossed the border by air increased twice in the period from 1990 to 1998.

More than 70% of all air traffic was handled by private companies. Among their major problems one could name the fact that aircraft used today by these companies are domestic (TU 134, TU 154, IL 86, YAK 40), they were designed and built in the 1960s - 1980s, and are now largely worn-out and outdated. More than 30% of the aircraft have been in use for more than 15 years. Local companies are desperate to get access to the needed financing for investments or leasing of new aircraft, or to be able to lease their own. The domestic banking and financial service market has not been able to offer, so far, competitive solutions to meet the growing financing needs of the local air carriers.

Pipeline Transport

Pipelines run from oil and gas fields of the Republic of Komi and Nenetsk District via the Arkhangelsk and Vologda regions to the Central Federal District. Other branches from Siberia and Povolzhye go as far as the Leningrad region and St. Petersburg via the Novgorod region. In the future, other main pipelines will run from the north to the south, since new oil and gas fields will be exploited in these areas.

The main oil pipelines are owned by the state (Transneft), while the main gas pipelines are owned by Gazprom (which is under state majority control). Branches from the main pipeline run towards certain fields that are owned by oil companies operating these fields.

Pipeline systems are actively developing in the Northwest Russia. At present, two large projects are being implemented, i.e. the Baltic Pipeline System, (from Timano-Pechora oil-and-gas field to the oil port Primorsk in the Leningrad region), and Northern territories (infrastructure development in the north of Komi and in the Nenetsk District with access to the terminal in Varandei).

Pipeline transport is cost-effective (the transportation of oil costs three times less than by rail), and is the largest in terms of freight flow.

The difficulties of transition in the 1990s were not as dramatic for pipeline operations as for other transport activities. The transportation volume and freight turnover decreased by less than 30% due to an associated reduction in domestic demand.

Related Industries

The most important related and supporting industries and activities for the transport sector of the Northwest Russia are the following

- the energy sector
- distribution (warehouses, supply chains, etc.)
- information technologies.

The growth of tariffs for energy, supplied by the natural monopolies, is one of the main factors influencing and increasing tariffs for transport, although the federal and regional governments control energy prices, which are still substantially lower than export prices.

Warehousing and distribution in the region (including port and railroad warehousing facilities and terminals), were in most cases not able to provide high quality services and the necessary reliability, which results in much higher average inventories.

At present, warehousing and local distribution is one of the least transparent sectors of the regional economy. The just-in-time concept, which could remove a substantial part of the burden from warehousing and distributors and reduce working capital needs, as well as increase flexibility to suppliers and consumers, is almost impossible to implement in Russia, in view of the present level of transport infrastructure. Frequent changes in customs policy, which lead to long delays, is another significant problem.

The development of logistics services is also relatively poor in the region. After the centralized distribution system of the Soviet period had collapsed, the introduction of new approaches to logistics has proceeded very slowly. This results in significant delays and even in freight loss, as well as in passenger traffic failures, and an increased number of transport accidents. An increase in turnover is determined, in most cases, by steadily growing tariffs. Large private companies are actually monopolies in domestic transportation[85] and are not motivated to be efficient.

Introduction of modern information technologies by domestic companies, which are involved in transportation activities, is rather limited. New information systems are introduced mainly by the largest players, such as the Oktyabrskaya Railroads (railroad transportation), LenTransGas (pipeline transportation), and the Pulkovo Airlines. They are used for controls and database development rather than to improve their overall performance. In most cases, first versions of ERP systems have been introduced at the local transport companies. Some ERP systems,

which are present on the domestic market, have been developed by regional IT companies. Modern systems are virtually not in use due to the lack of domestic and high price of imported solutions. Another significant problem, which is related to the introduction of complex corporate information systems, is the specifics of management of domestic companies, including "gray" accounting, lack of strict rules for document circulation, and complex organizational structures. In addition to this, the majority of companies do not possess essential equipment, such as modern computers. In many cases, the purchase of additional equipment makes IT projects too expensive for the companies to carry out.

Primary Issues and Challenges

At the moment, the most prosperous segment of Russian industry is that which is oriented towards export of raw materials and semi-finished products. It is estimated that more than 70% of Russian exports and imports goes through the Northwest Russia transport system.

In recent years, pipeline transport in the region has developed faster than others, due to the development of oil and gas fields of the Republic of Komi, Nenetsk autonomous district and the shelf of the Barents Sea. To provide some flexibility in pricing and tariffs, the local oil exporters are lobbing for and investing in port facilities (Primorsk and Varandei). As a result, in the NWFD a new pipeline network is developing with its own sources, mainlines, hubs (Uhta, Kirishi) and terminals. This network is connected with the all-Russia network through the junction in Jaroslavl (Central Federal District).

The railroad network, which is still a state monopoly, has not changed much since the Soviet period. In general, the Russian railroad has national significance; it is mainly oriented towards transportation to the key ports. Its connection with the railroads of Western Europe is rather limited. The future prospects for railroad and pipeline systems in Russia are largely dependent on the commitment and policy of the government.

The networks of water (sea and inland) transport are competitive practically at the national lines only because of low efficiency and reliability. The Russian merchant fleet practically ceased to exist, due to competition in international shipping, poor management and controversial privatization. However, the number of port facilities is increasing. Existing ports are being modernized and provide better quality for freight handling services.

At present, the network of water transport is quite unreliable. Its development depends on resolving the following issues:

– Is there any realistic ground for the new ports to be competitive in cost and reliability as compared to existing facilities in Latvia and Finland?

– What is the efficient mix of means of transport for the changing Russian trade structure, and when and how will this be integrated into the coordinated and focused policy of the Russian authorities?

The Northwest Russia motor transport network needs urgent improvement.

The future of air transport will be determined by an inevitable growth in international transportation. Increasing competition between international airlines may force some domestic carriers out of business, as a result of low efficiency, worn-out aircraft and low quality of services. The volume of domestic air transportation is decreasing due to the increasing economic gap between St. Petersburg and a few other air transportation nodes, and the vast hinterland. Restoration and development of domestic airlines will be possible only when the growth of the overall economy takes off in the remote regions.

At present, the transportation network of the Northwest Russia has a variety of structured networks (main lines, nodes, terminals), which have various specialized types of transport. The whole network is characterized by rather uneven density, (the lowest density is in the most resource-rich regions), and by overall degradation of networks[86]. These networks will be able to operate in the future only when focused and strongly committed actions are taken by the government in direction of their development and maintenance.

As the Russian economy further integrates into the global economy, it is expected that Russian foreign trade will increase substantially. This will require much more sophisticated transportation systems and related services to sustain the competitiveness of regional economies and companies. This represents a major potential constraint on development, and a challenge for the Russian business and government decision-makers if their aim is truly to achieve and maintain sustainable economic growth in the country.

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[86] With the exception of pipeline transportation network.

10 Views on Future Development

10.1 Development and Competitiveness of the Northwest Russian Clusters

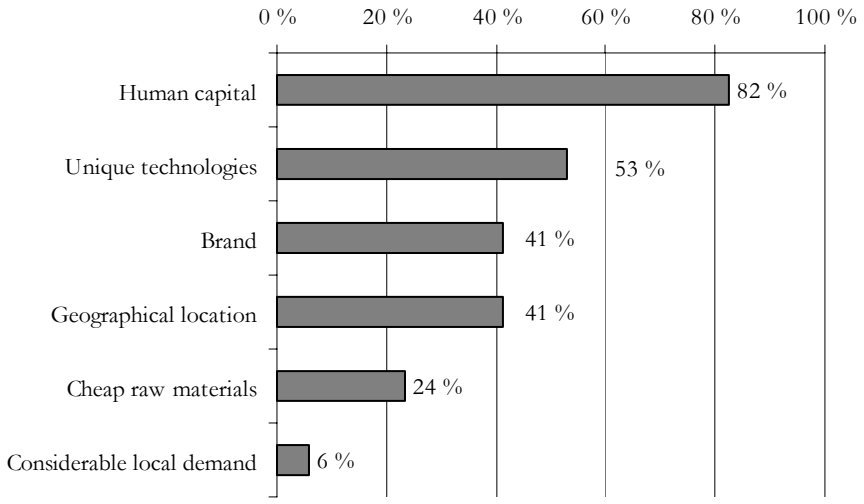
Analysis of the possible development trends and factors of over-the-border economic cooperation between Russia and Finland in the present study is based to a large extent on the analytical approach to regional economic development and competitiveness initially presented in the influential book *Competitive Advantage of Nations* by Professor of Harvard University Michael Porter. This approach combined the advances of many theoretical schools, although it was primarily rooted in the theory of industrial organization. After its publication in 1990 it quickly found recognition and is widely used for assessing issues related to industrial policy and development in many nations. Although initially, the analysis presented in the book was carried out on the national level, the later studies demonstrated that it is fully applicable to regional development studies, as well. Later research also expanded the initial view of competitiveness and creation of sustainable advantages in many ways. Scholars of business economics, strategic management, sociology and economic geography, and regional science have all provided their valuable inputs for furthering an understanding of the issues underlying sustainable economic growth. We have made our best effort to integrate these new perspectives into our study and analysis of future development presented in this chapter. In our work we have attempted not to provide ready-made solutions and recipes, nor to present mere scenarios of possible development, but to present ideas and views grounded in theory and up-to-date information that will enable readers to make up their minds about the future of economic development in Northwest Russia in general, and in the described clusters in particular, as well as about over-the-border cooperation between Russia and Finland.

As we know from previous research, making local products competitive on the world markets is important for regional and national economies, but to ensure growth and stability this competitiveness must be sustainable and self-enforcing. As the studies of the sources and sustainability of competitive advantages demonstrate, this is a complex outcome of many factors. In our study, we have uses an approach to sources of competitive advantage formulated in the "dia-

mond" model of national competitiveness by M. Porter, and have extended it on the basis of later studies to some other issues (impact of trade on economic development of regions according to new economic geography and network theories, the importance of proximity for the creation of sophisticated advantages, i.e. so-called untraded interdependencies, etc).

We have used not only available statistics, but also information collected from case studies as sources of information. During the case-studies phase of research, we collected additional corporate-level information, views and perceptions of the key persons in the selected companies related to competitiveness. Within the framework of this study, we carried out altogether 26 case studies of selected companies from the five clusters. The sample of companies was drawn from a list of the leading companies in the sector according sales, and illustrates a representative selection of the total population, due to the fact that the companies selected were the largest by far in the respective industries. We have also pledged not to disclose the names of respondents and companies in the publication in order to provide for an unbiased and open discussion during the survey. The case studies were carried out as structured interviews with selected executives of the companies. The results of the case studies are presented in the text below, and outline the various facets of opportunities, bottlenecks and obstacles to achieving sustainable growth and competitiveness in Northwest Russia.

Figure 10.1 Key Factors in the Competitiveness of Companies of Northwest Russia.



As we see from Figure 10.1, the managers value human capital and technologies as the most important sources of their advantage in Northwest Russia. In our more detailed questions later in this chapter related to the development of human capital and investments in technologies, we assess the prospects for sustainability of these advantages in the long term.

Managers also pointed to the importance of location, i.e. of the Northwest Russia as a gateway to western markets and existing brands as another important sources of advantage. As was discussed in the chapter devoted to the transport networks of the Northwest of Russia, their development today lags far behind the existing and future demand. This could become one of the most critical obstacles for further economic development and regional integration. We also see that the sustainability of the advantage of location in an era of diminishing transportation costs and rapidly developing communication networks that have led to further reduction of distances, need a thorough reconsideration. Otherwise, the importance of this advantage will fade as the time goes by. It is clear that development of transport networks is important and should be enforced by adequate progress in the communication networks in this area.

It is a good sign that brands are mentioned as important sources of advantage. Investments in maintenance of brand profiles and recognition are important for the sustainability of such advantage in the long term.

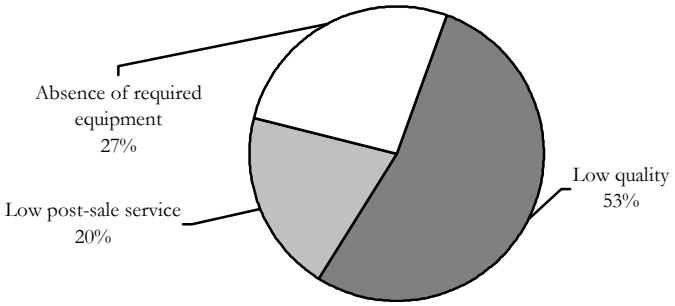
One of the important factors in achieving sophisticated advantages on global markets for primary products is the presence of advanced domestic producers of technologies and equipment, which can provide cutting-edge knowledge and processes to manufacturers, thus improving their ability to compete with manufacturers from other locations. In the case studies, we have assessed importance of local suppliers to companies in Northwest Russia.

As we see from Table 10.1, local equipment manufacturers are not important for companies in the region. In most cases, they fail to offer competitive products. The absence of purchase restrictions (in contrast to the situation during the Soviet period) allows local producers today to choose the best available technologies worldwide and benefit from global competition and specialization. On the other hand, there is some input that local technology manufacturers could offer to the manufacturers of primary goods in terms of strengthening their competitive advantage.

Table 10.1 Shares of Local Equipment Manufacturers and Suppliers in Total Supplies.

	<20%	*20%-40%*	*40%-60%*	*60%-80%*	*>80%*	*Mode*
Local equipment producers in total supplies	78%	6%	0%	17%	0%	<20
Local raw materials producers in total supplies	29%	18%	24%	12%	18%	<20

Figure 10.2 Problems of Local Equipment Manufacturers.



The availability of necessary technologies is not always the main problem preventing cooperation of primary products manufacturers with local equipment producers, as we see from Figure 10.2, in which most respondents (80%) stressed the low quality of equipment offered, or the absence of equipment with required specifications. Existing industrial capital and skills in technology manufacturing in Northwest Russia represent an opportunity that could, if exploited, lead to development of sustainable advantages in certain sectors with much less effort than is required in many other countries and locations. This also represents an opportunity for foreign investors, which should not go unnoticed in making investment decisions.

The local raw materials suppliers are relatively more important in Northwest Russia, which is noted by most of the respondents. This fact underlines the importance of basic factors of production in the local economy.

More than half of the companies interviewed named among their long-term partners regional R&D institutions. Many have long-term relationships with local universities related to personnel training. In addition, nearly 43% of the managers interviewed mentioned consulting firms as their independent partners.

Figure 10.3 Long-term Partnership with Universities, R&D Institutions and Service Firms in Northwest Russia.

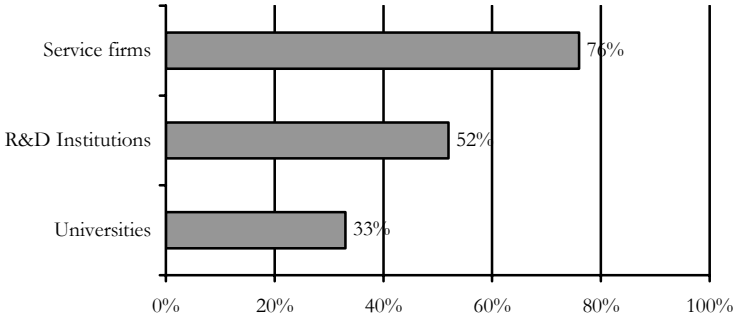
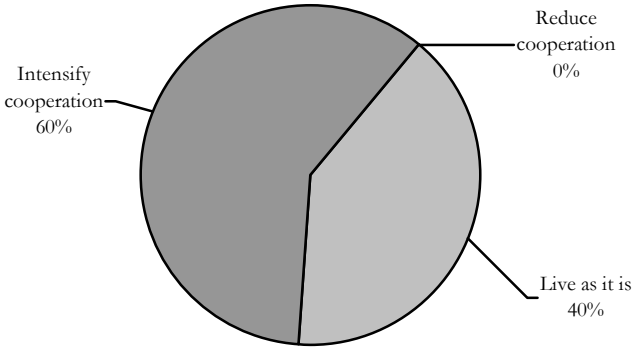


Figure 10.4 Views on Cooperation with Service Suppliers.

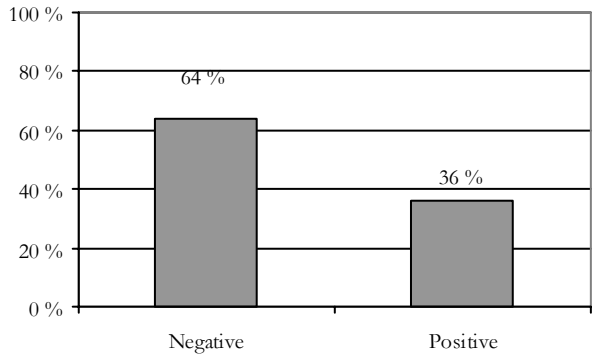


Most of the companies plan to develop cooperation with their suppliers from related and supporting industries and services, as we see from Figure 10.4. There were no respondents who replied that their companies were going to become more self-sufficient. The development of such cooperation promotes the diffusion of knowledge and optimal practices, enhancing what is offered on the market, and thus adding to the creation of more sophisticated advantages in the long term.

As we see from the above analysis, the potential synergies for creating competitive products and solutions make economic development sustainable in this area. Many of these positive tendencies could be enforced substantially by focused and committed actions on the part of national and regional governments. The identification of effective measures for such indirect support of economic development is at the top of the agenda in the developed countries of the world. So far, the emphasis of

Russian decision-makers has shifted to the more short-term issues, as we see from the responses in Figure 10.5.

Figure 10.5 The Impact of Government Actions on Competitiveness.



The majority of the respondents in our survey valued government action and industrial policy as negative, i.e. reducing the competitiveness of domestic producers. One of the major problems hindering development of industries in the new institutional environment in Russia is the industrial policy decision-making vacuum that emerged after the state planning system responsible for co-ordination of industrial development was dismantled. As a result, matters related to industrial development and policy-making are either neglected or uncoordinated by different branches of power. This relates not only to issues connected to overall economic development (taxation, etc.) and macro reforms (land ownership, etc.), but also to the industry and company level (standards, environment protection, the utilization of resources, energy prices, training of labor force, etc.). Such a state of affairs considerably complicates and even deters development of competitive clusters of industrial activity, and calls for focus and coordination in industrial policy.

The importance of the localization of activities in overall economic growth in the country is also underestimated today as a result of the approach inherited from the Soviet period. As can be seen from the examples of many countries, certain regions where industrial and economic activities are concentrated play a very important role in determining the long-term prospects for the whole country. A serious consideration of these issues points to the need not only for a new industrial policy that will resolve matters related to the overall environment and ensure renewable and upgraded factors of production, but also for a new regional de-

velopment policy that will take into consideration the effects of agglomeration and help to concentrate efforts in areas where achieving sustainable advantages is feasible, on the basis to existing advantages. Some ideas for a further agenda regarding industrial policy have also been outlined in the analysis of clusters in the preceding chapters.

10.2 Emerging Over-the-border Clusters

Russia and Finland are mutually important trade partners, as we see from Chapter 2 of the present study. Finland is even more important as a trade partner for Northwest Russia. There is a long tradition of such trade and cooperation, with roots in the history of economic and political union in the 19th and 20th centuries. A new impulse for such cooperation was given in the 1960s when bilateral trade with Finland began to develop on a preferential basis and a clearing trade mechanism was introduced. The amount of bilateral trade increased substantially. This agreement, unfortunately, did not resulted in the corresponding development of economic integration between the countries, as suppliers and consumers of both countries were separated from each other by the planning system of the Soviet Union. Among the positive results of this stage, we would like to point to the high brand recognition of Finnish-made goods that developed in Russia. Many of the brands delivered at that period to Russia are still highly valued and desired by Russian consumers. This relates equally to consumer products such as Viola cheese from Valio, Fazer chocolates, shoes by Topman, home appliances by Rosenlew, and hats by Fredriksson, as to business products and equipment, such as mechanical wood processing equipment by Valmet and Raute, pulp-and-paper equipment by Valmet, Tampella, etc.

After the collapse of the Soviet Union and the discontinuation of the clearing trade agreement between Finland and Russia, the situation changed once again. Trade today, after a period of decline and volatility in the 90s, is based on market mechanisms, and thus, reflects much better competitiveness of the products in both markets, i.e. of Russian products in Finland and of Finnish products in Russia, as we see from the analysis of bilateral trade in Chapter 2. The distribution networks and networks of suppliers and consumers were created by the companies of both countries in order to exploit opportunities for trade. The market economy developing in Russia as a result of reforms and related institutional changes brought in domestic competition, and opened opportunities for Finnish companies to become involved in businesses inside Russia. The lifting of restrictions on business activities and investments

abroad created a basis for Russian companies to be involved in the Finnish market as well.

As was noted in Chapter 2, there are also many complementarities between the industries of the two countries in question, which are related to

- differing stages of industrial and economic development (shifting from investment to wealth-driven development in Finland, according to the M. Porter's classification, and from the factor based on investment-driven development in Russia),
- availability of a wide range of natural resources in Russia that could be utilized with the knowledge, technologies and skills developed in Finland, which has resources similar in type to those found in Northwest Russia, but limited in quantity or in short supply today,
- marketing networks and skills developed by Finnish industries in industries that are very similar to those existing in Northwest Russia, as we observe from the study of clusters in the preceding chapters,
- access to a large-scale market for Russian products traded via Finland, i.e. access to the EU market, and for Finnish products in Russia, which could be the fastest growing market in the world for many product groups in coming decades.

Another possible basis for development of over-the-border clusters is the opportunity to shift manufacturing facilities to Northwest Russia, which could offer cost advantages and a skillful labor force, as well as the industrial capital necessary for that purpose. This development trend is in line with the convergence of the nearby-areas hypothesis. This hypothesis was created in an analysis of development of areas in Southeast Asia, such as Hong Kong and nearby areas of mainland China, etc. is the analysis demonstrates that in the event that the overall operating environment in both areas is friendly and cooperative, the lower income area tends to converge gradually with income levels of the nearby area through a shifting of manufacture to lower income areas, and the associated adoption of more efficient technologies and management systems from the wealthier area. The successful manufacturing companies of the wealthier area, on the other hand, enjoy the advantages offered by low costs of labor and raw materials of the lower income location, preserving the benefits of proximity (trust, cooperation on the employee level, training, etc.), and thus enforcing their competitive advantages vis-à-vis their competitors.

In light of the abovementioned features, i.e. high brand-recognition and awareness of Finnish products in Russia, various complementarities will motivate further development of trade and direct investments. This trend is further enforced by growing domestic competition and existing cost advantages, which could help create incentives for growth of investments in both countries, and alliances and partnerships between companies. Some effects of these new trends can already be detected in bilateral trade. For example, in metals and metal-processing the exports of Severstal steel that are further processed by Rautaruukki in Finland form a substantial item in the trade statistics of both countries. Rautaruukki is also the most profitable customer for Karelsky Okatysh's iron ore pellets, because it is the closest customer with the lowest transportation costs. In this cluster, we see that the recent development of over-the-border cooperation has already led to the first steps in integration and creation of over-the-border partnerships and alliances. The long-term partnership of Outokumpu and Norilsk Nickel is an example of this. Investments by Kuusankoski in scrap processing facilities is also an important step in over-the-border co-operation. Investments are oriented not only towards supporting growth in exports from Russia, but also towards servicing the needs of the growing number of domestic consumers.

In the forest cluster, Finnish companies are studying opportunities for growth by investing in manufacturing in Northwest Russia. Russia is also investing in Finnish mechanical wood-processing companies in order to gain access to markets and generate higher value added. A substantial amount of the raw lumber imports into Finland shows that further growth in this direction is difficult and a transfer of manufacturing facilities to Russia could be a viable alternative in the medium to long term. Further growth of the size of the domestic market in Russia could also be another motivation for Finnish forest companies to consider investments in Russia in distribution and manufacturing of consumer products, as well.

In the food cluster, there are already many success stories in direct investments (Baltic Brewery Holding investments in Baltika and Sinebryhoff investment in Vena brewerires in St. Petersburg) and trade (Valio, Ingman, etc). Inherited brand recognition and awareness of Finnish brands in Russia creates a good short-term opportunity to transfer production and improve distribution networks in Russia for Finnish manufacturing companies. There is also a good opportunity for related manufactures of the processing and related equipment to follow.

In the ICT cluster, we observe the successful investment of Sonera in regional cellular and data transmission operations. Elcoteq has its first

experience in contract manufacturing in its facilities in St. Petersburg. There is also a strong interest of Finnish companies of the ICT cluster in gaining access to the growing market and existing skills of software and communication engineers.

As we can see from the above, there are opportunities and the first steps in developing of stronger over-the-border clusters between Finland and Northwest Russia have already been taken. The areas of competitive strength are the same (forest industry, metals and metal-processing, ICT, energy), and there are complementary activities for each to offer to the other. The most important observation here is that, even though such development could be beneficial to both parties, it requires a well-developed industrial policy and the commitment of business and political leaders, as well as ordinary people in both countries. There is much to be done in this respect. The next chapter is a summary of the main components and directions of such possible actions.

11 Improving Over-the-border Cooperation

The present study has demonstrated that there is a substantial potential for the development of over-the-border cooperation between Finland and Russia in general, and Northwest Russia in particular. Current developments and opportunities related to such cooperation were described in detail in the preceding chapters. Now it is time to enumerate the important matters that might facilitate economic cooperation and integration between these areas.

One of the major issues in further development of the economy in Russia and its integration into global trade and information networks is the development of the infrastructure and networks. In this regard, the role of the Russian federal and regional governments is of crucial importance. There are numerous bottlenecks in the transport system on all levels. The road network in Northwest Russia is not sufficiently developed to meet the requirements of contemporary industrial realities. Many trade flows and investment decisions still depend on the limitations of existing waterways and railroads, which deter vast areas away from potential economic development. Coordinated development of the transport and trade hubs such as the ports of St. Petersburg, Murmansk and Arkhangelsk is also very important, as the service and reliability of these facilities lags far behind modern requirements. Integration into global networks also demands substantial improvement in capacity and quality of service of border-crossing facilities.

There is a call for more freight traffic by sea from the other important hubs of the world to Northwest Russia. Decision-making related to increasing efficiency of transport networks, and issues related to their efficiency, should be assigned higher priority. This relates not only to such immediate issues as the cost of transportation, but also to the additional indirect costs to businesses (delays and lines at the borders and at customs, etc.), and timing of deliveries. Serious attention should be paid to making just-in-time (JIT) deliveries possible for businesses operating in this area, as it is one of the major obstacles for further growth of export-oriented investments in Northwest Russia. Introduction of JIT opportunities could also result in enormous savings and additional returns for local business, and could jump-start many new direct investments.

Another equally important issue related to infrastructure development is the proper and safe operation of energy networks in the region. Transition to the open market and associated reforms is underway. This dec-

ade could become a major turning point in the development of the energy industries in Russia. In this respect, ensuring the further integration of Russian energy supply networks (more electric grids intersections and pipeline capacity on the border) is needed. The long-term energy futures of Russia and the EU should be duly translated into a strategy to develop the energy networks of Northwest Russia. It is also important to assess development trends for the various areas, and to develop and coordinate the strategies of the companies involved in order to provide energy supplies for the future needs of industrial development in the Northwest. There is a need for coordination and comprehensive rules in the energy trade between the countries and networks. A trend for growth in the electric energy and gas trade is expected in the near future in Russia.

The 21st century began as the era of knowledge, information networks and technologies. This global trend will also find due reflection in the strategies of governments on different levels. Development of the e-Russia and e-St. Petersburg projects is a good sign of such understanding. It is clear that a broader access to the Internet and information resources should also be provided to the populations of remote areas. Otherwise, vast areas could face dramatic depopulation (already a problem today), which could deter development of vast rural areas and raw material resources in Northwest Russia. There is also a need for new standards and approaches complying with modern requirements for communication networks, and regulations compatible with the rules applicable in the adjacent areas (Finland, etc.).

It is also clear that the development of Russia as a whole and Northwest Russia in particular, is no longer possible in isolation from the world economy. Trends for specialization and concentration of activities in areas offering the best advantages are rapidly taking place in the world. Such issues as reducing the psychological distances, i.e. differences in perceptions and attitudes related to different cultural environments, between Russia and the rest of the world, especially with neighboring areas such as Finland and the Scandinavian countries are very important. There are also numerous obstacles complicating integration in this respect. There are numerous formalities and bureaucratic obstacles, such as visa formalities (the prohibitive costs and lengthy processing periods in Russian Consulates abroad, the level of service, and requirements, intimidate many business travelers). This prevents further development of personal exchange and traveling, which was once one of the effective ways of reducing such psychological distance. Another area of concern is transparency and comprehensiveness of procedures and rules (accounting, reporting, registration procedures, etc.), which differ substantially differ-

ent from one country to another, and complicate excessively further co-operation and investment.

Facilitating knowledge and learning is another effective way of reducing psychological distance. This could be carried out through creation of compatible education programs, convergence of standards of education quality, information exchange (mass media - TV, radio, newspapers, bilateral exchanges, new media), student and teacher exchange, and creation of joint-research teams. There are many educational and knowledge exchange projects in Finland that are aimed at improving cooperation with Northwest Russia, which are in keeping with the above recommendations. We believe that there is an enormous potential for further development of such approaches in Russia, where the importance and rewards of such modes of cooperation and integration are not yet properly valued.

The issues enumerated above, concern not only the difficulties and obstacles to integration with the rest of world. They are also essential components of the so-called investment climate, which also includes such issues as a transparent and public economic policy and financial system, comprehensive rules and regulations providing equal treatment for domestic and foreign investors, etc. Although on paper things seem to have progressed quite far in a positive direction, more commitment and proof of implementation is needed. Certain practical issues could substantially improve over-the-border cooperation. In the metals and forest clusters, transparent and comprehensive rules related to the use of natural resources are needed. It is also imperative to develop standards and customs procedures in such a way, which correspond to the needs of exporters and importers, and facilitate trade and investment.

In summarizing the possible areas and directions for improving cooperation and integration, we would say that there is substantial potential in such development. The role of the Russian Federal Government and regional governments is very important. In this study, we have not only outlined the general issues, but have also demonstrated areas and activities in which development could bring about the best results and be mutually enhancing and beneficial. We hope that the issues and observations examined in this study will be of interest to the reader and have a positive on the process of development of over-the-border cooperation between the countries and regions.

Sources

1. Arhkenergo, www.arhen.ru
2. Association for the Protection of Investors' Rights, www.corp-gov.ru
3. Association of Mining and Smelting Companies of Russia, www.ampoc.ru
4. *Atlas of the Forests of the Soviet Union* (1973). Moscow.
5. Baltika Brewery, www.baltika.ru
6. *Pulp-and-Paper Industry Magazine* (2001), Russian Pulp-and-Paper Industry Database. Moscow.
7. Center for Strategic Research (2001), *Main Directions for Increasing Russian Forest Products Competitiveness.* Moscow.
8. Center for Strategic Research (2002), *Materials of the Seminar "Competitiveness of the Russian Forest Industry."* Moscow.
9. Center for Strategic Research, www.csr.ru
10. Cherepovets Steel Rolling Plant, www.chspz.ru
11. Colin J. Hazley (2000), *Forest-Based and Related Industries of the European Union – Industrial Districts, Clusters and Agglomerations.* ETLA, Helsinki.
12. Daria, http://www.cmak.ru
13. ECE/FAO (2000-2001), *Forest Products Annual Market Review.*
14. Electrosila, www.electrosila.ru
15. *Expert Northwest Magazine* (2001), Annual Rating of the Largest Industrial Companies of the Northwest of Russia. Moscow.
16. Expert source "Open economy," www.opec.ru
17. Federal Commission for the Securities Market, www.fedcom.ru
18. Finnish Forest Industries Federation (2002). *Finnish Forest Industries Annual Review in 2001.* Helsinki.
19. *Food Industry Business Magazine*, http://foodmart.faktura.ru/scdp/page
20. Gazprom, www.gazprom.ru
21. Goscomstat (2001), *Regions of Russia.* Moscow
22. Goscomstat (2002), *Russian Statistical Yearbook.* Moscow
23. Goscomstat, www.gks.ru
24. Goskomstat of the Republic of Komi (2000), *The Energy Complex of the Northwest Federal District and Kirov Region*
25. Goskomstat of the Republic of Komi, www.komistat.ru
26. Hernesniemi, H., Lammi, M., Ylä-Anttila, P. (1996), *Advantage Finland – The Future of Finnish Industries.* Taloustieto Oy, Helsinki.
27. Informconditer, Informational and Analytical Center for Confectionary, www.informkonditer.ru

28. Institute for the Economy in Transition, www.iet.ru
29. Izhorskiye Zavody, www.izhora.ru
30. Jaakko Poyry Consulting Oy (2002), *Competitiveness of Russian Forest Industry Report.* Helsinki.
31. Karelenergo, www.karelen.elektra.ru
32. Kolenergo, www.kolenergo.ru
33. Kolosovsky N.N. (1999), *Theory of Economic Regions.* Moscow.
34. Komienergo, www.rao-ees.ru/komienergo
35. Kovdorsky Ore Mining and Processing Enterprise, www.eurochim.ru
36. Krupskaya, http://www.krupskaya.com
37. Lenenergo, www.lenenergo.ru
38. Leningrad Nuclear Power Plant, www.laes.ru
39. Lentransgaz, www.lentransgas.ru
40. Lukoil, www.lukoil.ru
41. Market-Visio/EDC (2002), *Project Software Market in Russia.* Moscow
42. McKinsey Global Institute (2000), *Unlocking Economic Growth in Russia*
43. Metallurgy Portal, www.metal.com.ru
44. Ministry for Antimonopoly Policy, www.maprus.ru
45. Ministry for Energy of Russia, www.gov.ru/main/ministry/isp-vlast47.html
46. Murmansk Trawl Fleet, http://www.mtf.ru
47. National Russian Server for Meat Processionals, http://www.meat.ru
48. NIPIEIlesprom (2002), *Forest Industry of the Russian Federation in 2001.* Moscow.
49. Norilsky Nikel, www.nornick.ru
50. Northwest Media Group (2001), *St. Petersburg Telecom. Communication Encyclopedia.* St. Petesburg
51. Northwest Media Group, http://www.comnews.ru/
52. Novgorodenergo, www.novgorod.net
53. OECD (2001), *International Trade by Commodities Statistics ITCS*
54. Olenegorsky Ore Mining and Processing Enterprise, www.olcon.ru
55. Parnas-M, http://parnas.spb.ru http://www.meat-union.ru/~parnasm/history.htm
56. Pechora Power Plant, www.rao-ees.ru/pechgres
57. Polustrovo, http://www.bestrussia.net/polustrovo/company.html
58. Porter M. (1990), *The Competitive Advantage of Nations.* Houndmills, London.
59. Pskov Power Plant, www.pskovgres.elektra.ru
60. Pskovenergo, www.rao-ees.ru/pskovenergo

61. RAO UES of Russia, www.rao-ees.ru
62. Reunala, A., Tikkanen, I., Asvik, E. (1999), *The Green Kingdom - Finland's Forest Cluster*. Otava Publishing Ltd, Helsinki.
63. Russian Ministry for Telecommunications and Informatization (2002), http://www.minsvyaz.ru/
64. Russian State Concern for Generation of Electric and Thermal Power at Nuclear Power Plants (Rosenergoatom), www.rosatom.ru
65. Rybakov F.F. (2000), St. Petersburg Economy: The Past, Present and the Future. St. Petersburg.
66. Severgazprom, www.severgasprom.ru
67. Severstal, www.stal.ru
68. Sotovik, Information and Analytical Agency, http://www.sotovik.ru/
69. State Committee for Statistics (Goskomstat) of the Republic of Komi (2000), *Forest Industry of the Regions of the Northwest Federal District of Russia and Kirovsk Region*. Syktyvkar.
70. State Committee for the Environment Protection, www.ecocom.ru
71. State Customs Committee (2001), Statistical Book. Moscow
72. Surgutneftegas, www.surgutneftegas.ru
73. The Federal Commission for the Securities Market of Russia, Information Disclosure, disclosure.fcsm.ru
74. The International Iron and Steel Institute. www.worldsteel.org
75. Timan Bauxite Ore, www.sual.ru
76. Transneft (oil pipelines), www.transneft.ru
77. Turbine Blades Plant, www.ztl.ru
78. Forest Industry Portal, www.drevesina.com
79. Fishing Industry of the Northwest of Russia, Information portal, www.fishnw.ru
80. *Russian Food&Drinks*, Market Magazine, www.foodmarket.spb.ru
81. Food Industry, Publishing House, www.foodprom.ru
82. Forestry Industry Information Site, www.forest.ru
83. Russian Companies, Information Portal, www.infors.ru
84. Business Information Portal, www.internord.ru
85. Confectionary Industry in Russia, Information portal, www.konditerprom.ru/
86. Forestry Industry Information Portal, www.lesprom.ru
87. Beer Information Portal, www.propivo.ru
88. Information and Analytical Portal, www.rbc.ru
89. Yantarenergo, www.yantene.ru