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**ENERGY³: RAW MATERIALS,
PRODUCTION, TECHNOLOGY**

**Competitive Analysis of
Northwest Russian Energy Cluster**

ETLA, The Research Institute of the Finnish Economy

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ABSTRACT: Energy industries in Russia and in Northwest Russia in particular are of the utmost importance and occupy the largest shares in the total industrial production and exports. Northwest Russia is developing into the major export hub for the Russian energy exports. It means that the appropriate infrastructure and potential to establish processing facilities are created in this area. Energy industries play also an important role as essential suppliers for many local producers. As many Northwest Russian manufacturing industries are still very energy consuming, energy efficiency and energy cost will have a strong effect on their profitability. The so-called energy complex created in the Soviet period in Russia and in Northwest Russia was based on the command economy, not market principles. Therefore, the transition to the market economy led to profound changes in the industry structure and allocation. These changes need to be assessed in order to adjust the business and industrial policy-making to changing circumstances. Analysis of the Northwest Russian energy cluster consisting of oil, gas, coal and peat production and processing, power generation and power engineering industries as well as supporting industries and associated services (prospecting, maintenance and transport, etc.) was aimed to serve this purpose. The analysis was carried out basing on trade and industrial statistics, company data and interviews. As a result the growth prospects and competitive advantages and disadvantages of the energy cluster are identified and described.

KEY WORDS: Northwest Russia, energy, industrial complex, cluster, regional agglomerations, growth, competitive advantage, industrial policy.

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Summary

The present paper is devoted to the analysis of the Northwest Russian energy industries in the new conditions of the transition to the market economy. Northwest Russia is one of the seven federal regions of Russia. It borders with Baltic States, Finland and Norway. Nearly 15 million inhabitants live in this area. Administrative center of this federal region is the City of St. Petersburg. Northwest Russia is rich in oil, gas and coal. A very substantial part of the current production is exported. Electric power and heat are produced at the large and concentrated carbon fuelled power plants. In addition to this, hydro- and nuclear power are of great importance as sources of electric energy. Part of the electric power is exported to Finland and to the Northern European electricity market. The City of St. Petersburg is undoubtedly the center of the Russian energy technology manufacturing.

The energy cluster plays a leading role in the economy of Northwest Russia, equal to that of metallurgy and metalworking. In the period of transition the energy companies developed into the major source of budget revenues for federal and regional governments in Russia (about 40% of the total). The energy industries (oil and gas) performed substantially better than many others in the period of sharp decline in domestic demand during the initial phase of transition. This was a result of their ability to shift relatively easily to exports, as their products were competitive on the world market. Today more than 50% of the total exports in Russia are represented by the energy. Today these are the most export-oriented industries in Russia. There are also energy industries in Northwest Russia that were not successful in the period of transition. These are the coal, peat and shale oil production.

The period of transition brought also other changes that have a profound effect on the future of the energy industries and an overall economic development in the country. The pricing principles have changed from centralized and set by state bodies to the ones based on true costs of companies. Changes in the tariff policy, mergers and acquisitions, the restructuring of natural monopolies, the creation of market for maintenance and services, and other processes that are now underway will significantly influence the energy industries in the future. The energy industries in Russia are still preserving many remains of the Soviet system. They are largely state controlled, monopolized and regulated. All this has an adverse effect on the overall economics and competitiveness of the

Russian economy. The urgent necessity for changes is well understood on the highest levels of decision-making in Russia. To reform energy industries and make them internationally competitive is among the major challenges that the Russian Government is facing today. The ideas related to reforming the energy industries to the new conditions, to opening the markets for competition are among the most widely discussed matters at present. There is no consensus reached on these matters so far. There are many who support market reforms and many who oppose. The outcome of these debates is difficult to forecast.

The described changes will not only be associated with forthcoming reforms, - the directions and dynamics of development of the cluster are being determined by fundamental factors and conditions that are already in place today. Such factors that underlie economic growth could be assessed using M. Porter "diamond" model of the national competitiveness in a systematic way. These model is targeted to study 1) competition, industry structure and business strategies, 2) demand characteristics such as market size, growth and how demanding in terms of specific product characteristics the customers are as well as other demand related matters and condition of the user-producer relations, 3) extent of the cluster company networks, state of development of different areas of activity and dynamics of networking, and also 4) inherited assets such as raw material resources, locations, industrial assets and created factors, importance of which is growing today, i.e. availability of educated workforce, R&D, financing and transport and information and communication infrastructure. Government decisions or their absence could be also observed through the prism of the above factors. These factors and conditions will determine both the current competitive positions and the future potential of the companies. This model was used to assess the competitiveness and development prospects of the regional energy cluster of Northwest Russia. This framework was adjusted and fine-tuned basing on the recent developments in the strategic management, regional planning and new economic geography theories to fit into the analysis of the regional cluster.

We believe that the cluster approach is, owing to the two main reasons, a good tool to assess industrial change in the Russia and its regions: 1) The planning, allocation and investments in the Russian industries were made on basis of the regional scientific-industrial complex thinking. It incorporated many ideas similar to the ones included in the proposed cluster approach such as importance of proximity and agglomeration effects as well as education and R&D were an essential part of the complexes, its knowledge basis. 2) Although the model is not especially targeted or equipped to assess the transition economy, it still allows to gen-

erate a vision of the possible development outcomes, i.e. it demonstrates how the future competitive cluster shall look like and represents an extensive list of determinants that could influence its competitiveness. This method allows evaluating the possible development of the cluster in a systematic and broad way. In other words, not only the primary industries, in case of the energy cluster, oil and gas production and processing, electric energy and coal, etc. are assessed but also their interdependence as well as the influence of the related and supporting industries, associated services and government actions on the competitiveness are analyzed.

At present, the energy industries are among the most important sectors of the regional economy. Moreover, the importance of the cluster and its regional differentiation are expected to increase in the future, due to the exploration of new oil and gas deposits, the growth of the volume of production of power engineering, the possible creation of new oil refineries and increase in the transit flows aiming at exports through the newly created infrastructure in Northwest Russia (ports on the Baltics in Primorsk, Vysotsk, Ust-Luga, etc and on the Barents Sea in Varandei Bay, etc.. There is a good basis for such development as the energy industries in Northwest Russia traditionally played a very important role in Russia. In the early Soviet period the GOELRO plan of the electrification started in Northwest Russia and was the first economic development program that a new Soviet state committed to develop after the revolution.

As we see the energy cluster of Russia has had a long evolution. Its development started from transition to steam-driven engines and use of electricity as well as from extraction of oil from the oil fields near Baku. The most significant oil and gas fields, power plants as well as other facilities and infrastructure were created during the Soviet period. The cluster developed in this period as an isolated, domestic market oriented system within the command economy. Its international connections and integration into the global trading and manufacturing networks were practically non-existent. Energy has had an important mission in the Soviet system. The enormous natural treasures of the country made it possible to develop the industry, they were used to provide nearly free electricity and heat for the population.

After the Second World War development of the energy companies and technologies was among the most important national priorities. Northwest Russia was chosen as the location for the equipment manufacturing and R&D for the energy sector in that period. As a result, the energy technology oriented regional scientific-industrial complex was created here in the late Soviet period.

Today, most of the products in the cluster are exported, and this trend will clearly persist in the future. The oil companies are already the most advanced in Russia. These companies are run as the similar companies in the developed world. The degree of integration of the cluster into the global network will grow, and so will its dependence on processes unfolding on a global level. It is anticipated that the structure of the foreign trade will change. There will be more processed energy exported in future. There are also the first signs of internationalization by the oil companies that are looking at investments abroad. We believe that this trend will substantially develop in the near future.

Russia has a substantial positive trade balance with OECD countries in terms of energy products. In particular, oil, oil products, and gas form the basis of Russian exports and are the country's primary source of hard currency (Chapter 4). These goods – in Northwest Russia, primarily oil and oil products, as reserves of gas in deposits under exploitation in the region are relatively small – are in high demand on the world market, which serves as the most important prerequisite for the potential successful development of the cluster in the future. The export of electric energy is still small, but it also has potential for significant growth. At the same time, Russian imports of energy products are insignificant.

Another important feature of the energy cluster in Northwest Russia is its regional concentration that determines the further development of the certain activities in already developed locations. The authors of the study have singled out four large agglomerations of the cluster (Chapter 5): Pechora (oil, gas); Vorkuta (coal), St. Petersburg (electric energy, oil processing, power engineering), and Kola (electric energy). The Timano-Pechora (oil and gas) and the St. Petersburg (power engineering) agglomerations, which carry the greatest weight on the domestic and foreign markets, will largely determine the further development of the cluster.

Today, the primary sectors of the energy cluster of Northwest Russia include oil extracting, oil refining, gas, coal, and shale industries, electric energy. These sectors are undergoing restructuring and adaptation to new economic conditions. The degree of restructuring of various sectors of the cluster differs, however, and there are sharp discrepancies in their competitive potential.

Research has shown (Chapter 6) that the single obvious competitive advantage of the energy cluster in Northwest Russia now is its wealth of raw materials, in particular, oil and gas deposits that were already explored during the Soviet period. In the last ten years, however, investment in the development of raw material resources, as well as in other

factors of production (manufacturing facilities, infrastructures, human capital), has been insufficient. This has undermined much of the former potential in these areas. Oil production and oil refining, the most successful branches of the cluster, were exceptions to this pattern.

During the crisis in the Russian economy, which resulted in a sharp reduction in domestic demand, foreign markets played a vital role in sustaining the energy cluster. In recent years, starting from the 1998 when the domestic currency sharply devaluated, the domestic market has grown steadily. It has a long way to go, however, before it recovers the volumes it achieved during the Soviet period. Changes in the structure of demand have given rise to differentiation within the cluster. Industries with high export potential (the oil and gas sector) are distinguished by relatively high prosperity, whereas the oil and shale industries, and power engineering, to a certain degree, are today experiencing serious difficulties.

On the corporate level, the major problem in the cluster remains the low level of competition. The markets of the basic industries of the cluster are monopolistic or oligopolistic. The prices remain regulated by the state on the costs plus amortization basis (except oil). Anticipated liberalization of prices for such energy sources as gas and electric energy will be a major catalyst for further changes in the industry structure and will change its structure. Increase of the domestic prices to the levels of export prices will motivate energy saving and increasing of the efficiency. Also the energy producers will concentrate on more efficient solutions that will be seen in improving the profitability on the contrary to the current situation. As a result in the medium to long term there could be development of the dispersed energy production (for example combined power and heat production in smaller settlements), increase in usage of biofuels (first of all wood and wood waste based).

The most important part of the Northwest Russian energy cluster is the energy technology production and related education and R&D. These activities are concentrated in St. Petersburg where the turbines, generators, electric engines, gas pipeline compressor units are designed and manufactured. All types of the power plants are also designed in this city. During the ten years investment break these activities have suffered much more than the energy production itself. For example, hiring of the new personnel, i.e. training of the future professionals, ceased nearly completely during this period. Problems of the power engineering will make also upgrading of the energy production activities more difficult. This is an area where focused industrial policy could achieve a lot in closing the gap between the current utilization of the potential and actual anticipated demand. For example liberalization of the electricity markets

will result in substantial increase of investment. There is a sharp deficit of entrepreneurs and entrepreneurship in some areas of activity. There also completely new markets such as a potentially very large market for industrial services and financial services taking shape at the moment. The monopoly companies of the socialist period carried out these activities themselves and financing was obtained always from the state purse.

Involvement of the Russian federal and regional governments in development of the energy industries is urgently needed in new, indirect way. Excessive government regulation of the cluster has hindered the pace of its reforms, in contrast to other branches of industry. Industrial policy is still inconsistent and devoid of clearly formulated goals. The direct, short term measures are most often preferred instead of more sustainable indirect influence through building the infrastructure, improving education and research as well as creating a favorable investment and business climate. Among other significant problems are the low level of transparency of business, the significant burden of social welfare (as an example the obligations to employ local personnel in great numbers and maintain the local social welfare facilities), and very high levels of environmental pollution.

Each of the major industries of the cluster possesses both positive features, capable of stimulating its development in the future, and bottlenecks (Chapter 7). It is demonstrated that the existing factor conditions, i.e. inherited assets and infrastructure, human capital, R&D and educational system create a good background for the further development. Nevertheless achieving growth will require substantial investments and changes in the production allocation for many areas of activity. Improving competitiveness of the Northwest Russian oil and gas industries will require to reduce by the order of magnitude the costs of the pipeline transportation. It is envisaged that new, breakthrough solutions and approaches will be needed. As an example introduction of the ice-breaking supertankers to deliver oil and liquefied gas from the Barents Sea directly could be one of such innovative answers to this challenge.

In order to ensure its successful development, the cluster must grapple with a series of problems directly related to improving the investment climate. Among the key problems are the excessive regulation, the slow transition to the new international standards, bureaucracy, complicated and often contradictory legislation and slow restructuring. There is also an urgent need for the more consistent policy and clear commitment to market reforms. A great interest in the development of the energy industries expressed by the governments on the federal and regional levels leaves a hope that the underlined changed will follow soon.

We believe that the greatest prospects for the development of the cluster are connected with the growth of the domestic market, the growth of competition as a result of reforms, and the increasing importance of Northwest Russia in both exporting and processing of energy raw materials. Growing importance belongs also to the growing exports of the raw and processed energy. The importance of Northwest Russia in European and global energy supplies will increase. As a consequence the investments in oil and gas prospecting and involving of the new fields in the industrial use and development of the related infrastructure will grow as well.