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## Development of regional cluster initiatives as an instrument of innovation policy in Russia

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## **Development of regional cluster initiatives as an instrument of innovation policy in Russia**

### **ABSTRACT**

Modern trends in regional economic development in Russia are characterized by dynamic structural changes and lead to the clusters formation. Cluster is a specific form of the spatial organization of industries and services, that are considered as a tool for innovation policy aimed at stabilizing the rate of economic growth.

The concept of innovation clusters development represents a new approach to the structural development of the national economy in general. It is based on the nonlinear nature of the economic processes development in the region, especially in the transition to innovative development. Clusters are considered as the most mature form of the organization of innovative production that will support economic growth. Moreover, the operation of innovative enterprises in clusters offers great opportunities to create and develop their competitive advantage.

Innovation policy is a system of rules and regulations governing the procedure of innovation implementation, both in technology and in the technology management in accordance with the strategic direction of economic development. The main task of innovation policy – to achieve the maximum possible degree of interests harmonization among participants of innovation process. To solve this problem there are used special tools to ensure efficient usage of area resources - clusters.

Innovation policy, based on clusters, requires two complementary strategies:

1. strategy to ensure the efficient use and dissemination of knowledge;
2. strategy aimed at creating scientific and innovative networks within the cluster.

Clusters formation enables to take advantage of them for the implementation of regional innovation policy, that increases the efficiency of small innovative businesses, rises tax revenues to the regional budget, reduces entry barriers for small-scale innovative companies to the markets of raw material suppliers and product market, improves financial stability of companies and reduces costs of production, creates opportunities for accessing foreign markets and attracting qualified staff.

Cluster initiatives in Russian regions interconnected with the strategy and innovation policy. Therefore, innovation policy of regions in Russia is not an adopted result of theoretical model of successful cluster initiatives, but it is a composite of various measures, and we can mark a significant specificity of regional innovation policies.

Taking into account the characteristics of innovative development of Russian regions and existing types of clusters, it is necessary to construct an innovative policy to optimize the ratio of cluster initiatives and tools to manage them. Innovation policy and technological breakthrough by implementing cluster initiatives will make possible for Russia to become a leader in the particular (albeit narrow) areas of the technology world. However, it needs to evaluate these initiatives of innovative capacity, reasonably determine the scientific and technological niches and concentrate efforts and resources on their fast development, because time is running out, and if belatedly, these niches will be occupied by other countries.

**KEYWORDS:** Innovation policy, cluster, infrastructure, region, strategy, cluster initiatives.

Socio-economic development of Russia, and its competitiveness in the international market (closing the technological gap) provided, first of all, the implementation of a national innovation policy. Its main purpose is to create effective communication tools and innovative system for building a knowledge economy. In consideration of Porter's theory<sup>1</sup>, based on the fact that a competitive industry can not be distributed evenly in the economy and tend to be concentrated in certain geographic areas, and form clusters, then these clustered territories eventually become areas of investment, and its core consists of few powerful companies with remained competitive relationship between them. This is the reason why cluster is different from the cartel or financial group - concentration of competitors, their customers and suppliers promotes efficient specialization of production. At the same time cluster employs many small firms and small businesses. In addition, a cluster form of organization leads to the creation of a special form of innovation - the "aggregate innovation product". Clustering based on vertical integration generates not spontaneous concentration of various scientific and technological inventions, but system of new knowledge and technologies dissemination. In this case, the most important condition for the effective transformation of inventions into innovations, and innovations into competitive advantages is the formation of a network of stable relations between all the participants in the cluster. Buildup of highly specialized

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<sup>1</sup> Porter, M. Competition /M. Porter. - M.: Williams, 2002. – p.496.

factors in one place increases the exchange of information and economic interaction, that gives the sources for new knowledge and skills, which leads to innovation. Concentration of capital in one place, which is already taking venture shape, helps to ensure that innovative ideas are translated into final innovative products and processes<sup>2</sup>.

The concept of innovation clusters development represents a new approach to the structural development of the national economy in general. It is based on the nonlinear nature of the economic processes development in the region, especially in the transition to innovative development. Clusters are considered as the most mature form of the organization of innovative production that will support economic growth. Moreover, the operation of innovative enterprises in clusters offers great opportunities to create and develop their competitive advantage. Investigation of the clusters effect on the regional and national economy, studied by the Organization for Economic Cooperation and Development<sup>3</sup>, found that the clusters have made a huge contribution to the improvement of economic conditions in many countries, for example, in Denmark productivity and profitability in the clusters increased, clusters in Italy stimulated economic growth, industrial clusters in Portugal defined as the base of engineering knowledge, and as centers of innovation in the U.S., in Finland clusters formed educational complexes.

Therefore, innovation policy of regions in Russia is not an adopted result of theoretical model of successful cluster initiatives, but it is a composite of various measures, and we can mark a significant specificity of regional innovation policies.

The following major features of the innovation policy in various regions of Russia was determined (Table 1).

Table 1.

**Peculiarities of innovation policies in Russian regions**

<i>Direction of innovation policy</i>	<i>Peculiarities</i>	<i>Regions</i>
<i>Structure optimization of regional innovation policy</i>	Optimization and planning innovation support	Moscow region, Perm region, Tatarstan, Krasnodar region

<sup>2</sup> Ludmila Voronina, Svetlana Ratner. Spatial development of the Russian cluster economy / Voronina, L. Clustering of World Economy: Myth and Reality. - LAMBERT Academic Publishing GmbH & Co. KG, 2011. – p.263.

<sup>3</sup> Fostering Public-Private Partnership for Innovation in Russia OECD, 2005

<i>Direction of innovation policy</i>	<i>Peculiarities</i>	<i>Regions</i>
	Funding optimization for science and innovative sphere	Tomsk region, Krasnoyarsk reg., Novosibirsk reg., Samara region, Smolensk region.
	Fundamental research development	Leningrad region, Tomsk region, Novosibirsk region, Moscow region, Moscow city, St.Petersburg city.
<i>Stimulating of business and science (universities) innovative cooperation within the region</i>	Promoting of universities and corporations convergence	Moscow city, St. Petersburg city.
	Large public investments in science and innovation and attracting national private capital	Kaluga region., Ulyanov region, Tatarstan, Moscow, St. Petersburg
	Stimulation of innovation activities in the private sector with the involvement of foreign capital in the innovation sphere	Bashkortostan, Tatarstan, Tomsk region, Kaluga region, Lipetsk region.
	Stimulation of innovative initiative in science sector	Moscow, Krasnoyarsk region, Tomsk region, Kaluga region.
<i>Integration in international innovation networks</i>	Comprehensive integration	Moscow city, St.Petersburg city.
	Technological specialization	Bashkortostan, Tatarstan, Tomsk region, Kaluga region, Lipetsk region, Irkutsk region, Krasnoyarsk region.
<i>Presence of science cities</i>	Creating of special conditions for the formation of bonds in innovation	Nizhegorodskiy Region, Khabarovsk Territory, Tomsk region, Chelyabinsk Region, Kaluga region, Altai Territory, Arkhangelsk region, Irkutsk region, Krasnoyarsk, Moscow region, Penza region, Sverdlovsk region, Tambov region, Yaroslavl region. Moscow city, St.Petersburg city.

<i>Direction of innovation policy</i>	<i>Peculiarities</i>	<i>Regions</i>
	Stimulation of regional initiatives	Moscow city, St.Petersburg city. Tomsk region, Kaluga region.
<i>The most promising tools of innovation policies</i>	Development of cluster initiatives	Tomsk region, Kaluga region, Novosibirsk region, Moscow region, Rostov region.
	Initiating the integration of science and education	Moscow city, St.Petersburg city. Tomsk region, Novosibirsk region, Irkutsk region, Krasnoyarsk territory.
	Involvement of small- and medium-scale enterprises in the innovation sphere	Tatarstan, Penza region, Пензенская обл., Khabarovsk region, Rostov region.
	Identification of priority export directions in the field of high technology	г Moscow city, St.Petersburg city. Kaluga region, Samara region.

There are two basic models of regional innovation policy:

1. model of innovation policy, oriented to fundamental research programs and projects of national significance;
2. model of regional policy, focused on the promotion of scientific and technological knowledge.

Depending on the policies pursued in Russia, regions can be divided into three groups:

- regions, stimulating innovations through the development of innovative infrastructure for susceptibility to the achievements of world science and technology, coordination of different sectors in the field of science and technology (Bashkortostan, Tatarstan, Tomsk region, Kaluga region, Lipetsk region, Irkutsk region, Krasnoyarsk territory);
- regions, aimed at creating a favorable innovation environment (Tatarstan, Irkutsk region, Novosibirsk region)
- regions, focused on leadership in science, implementation of large-scale targeted projects, covering all stages of the innovation cycle, usually with a significant scientific and

innovative potential in the military sphere (Moscow, St. Petersburg, Tomsk region, Novosibirsk region, Kaluga region, Krasnoyarsk territory) .

Innovation policy is a system of rules and regulations governing the procedure of innovation implementation, both in technology and in the technology management in accordance with the strategic direction of economic development. The main task of innovation policy – to achieve the maximum possible degree of interests harmonization among participants of innovation process. To solve this problem there are used special tools to ensure efficient usage of area resources - clusters.

Innovation policy, based on clusters, requires two complementary strategies: strategy to ensure the efficient use and dissemination of knowledge and strategy, aimed at creating scientific and innovative networks within the cluster.

In Russian regions there are following types of clusters developing:

1. *Infrastructure-innovational*, it is formed around a system of guaranteed consumer products, it uses already existing regional infrastructure with implementing of new technological solutions (cluster "Skolkovo" - Moscow Region, aerospace cluster - Dubna, Zhukovsky, Queens, Star City, Moscow region, Plesetsk, Arkhangelsk region).

2. *Innovation cluster* is formed by a government guarantee, without a guaranteed demand for its products by consumers (cluster "Nanotechnology" - Moscow, Novosibirsk region, Tomsk region)

3. *Ultra-structural or meta-industrial cluster*, which is formed on the basis of industrial development with the usage of new technologies (cluster "Miass" - Chelyabinsk region, cluster "Seversk" - Tomsk region, cluster "Chernogolovka" - Moscow region)

4. *Adopted cluster* is formed by using international experience and is based on technology import (wine cluster in Krasnodar region).

Clusters formation enables to take advantage of them for the implementation of regional innovation policy, that increases the efficiency of small innovative businesses, rises tax revenues to the regional budget, reduces entry barriers for small-scale innovative companies to the markets of raw material suppliers and product market, improves financial stability of companies and reduces costs of production, creates opportunities for accessing foreign markets and attracting qualified staff.

Cluster initiatives in Russian regions are interconnected with strategy and innovation policy. In general, there are three main types of clusters:

- clusters of economic activity in related sectors, usually linked to some research institutions (research institutes, universities, etc.);

- clusters with vertical production connections in narrow areas of activities, formed around the head office or the network of main companies, covering manufacturing processes, supply and distribution;
- Industrial clusters in different types of production with a high level of aggregation (eg, "chemical cluster"), or at an even higher level of aggregation (eg, "aerospace cluster")<sup>4</sup>. Cluster is an aggregating definition and includes such technical and economic research units as business incubators, technoparks, industrial parks, science cities.

Clusters have seven main features, the combination of those in one or another way characterizes any of them:

*Geographic* – this feature describes clusters, which are clearly associated with a particular territory, from local clusters (canned fruit) to a truly global, for example, the aerospace cluster;

*Horizontal* - several industries / sectors may enter on equal terms to the larger cluster;

*Vertical* - characterizes clusters with hierarchical link adjacent stages of the production and innovation process;

*Lateral* - reflects the clustering of different sectors of the same industry that provide economies of scale and lead to new opportunities;

*Technological* - cumulative industries related to the same technology;

*Focal* - this feature describes clusters of companies, focused around one center - leading large enterprise, research institute or university;

*Qualitative* - defines the cluster of firms, improving all areas of cooperation, favouring the growth of each member competitiveness, and thus enhancing the economic status of the community<sup>5</sup>.

Let us consider current cluster initiatives, generated and implemented in the regions of Russian Federation as the main tools of innovation policy.

### **Cluster initiatives Moscow region**

In the city Dolgoprudny, Moscow region, will be created innovative cluster at the Moscow Institute of Physics and Technology (MIPT). To implement this initiative, regional

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<sup>4</sup> Menzel MP, Networks and Technologies in an Emerging Cluster: the Case of Bioinstruments in Jena, in C. Karlsson, B. Johansson and R. R. Stough (Eds) Industrial Clusters and Inter-firm Networks, 2005.

<sup>5</sup> A. Mikheev. Development of clusters in regional economies: benefits, problems and support // Problems of modern economics-2008, № 3 - p.355-358.



authorities will allocate for MIPT 2.6 hectares of land. There a technology park will be build, where well-known IT-company will found their representative offices. Besides, boarding school for gifted children education will be build on innovation cluster territory. The total cost of the project to create an educational institution might be about 1.5 billion rubles. This school will accept up to 700 students. In April 2013, the program of the project "MIPT-XXI" will be presented in front of President of Russia. Implementation of the project will take place in three stages: first one- by 2015, the second - by 2020, and the third - till 2025.

Innovation cluster "Skolkovo" is rapidly expanding. Group "Renova" invested in 2013 \$50 million in venture capital fund that will finance companies in the areas of new media, IT-medicine and the Internet. Priority is given to projects that have been approved in the "Skolkovo". Structure will focus on investments for a period of five to seven years. The average size of investment in a project should be between five to seven million dollars. About 20% of the money will be spent on "growing" companies in venture capital fund.

### **Cluster initiative Novosibirsk region**

Innovation cluster in Novosibirsk region is based on cooperation with foreign partners. British oil giant BP signed an agreement with a subsidiary company of the Novosibirsk State University and Institute of Catalysis under Siberian Branch of Russian Academy of Sciences, LLC "Unikat", to create a center of applied research for the development of energy efficient technologies in production and transportation of oil. Realization of this project will create technologies to reduce carbon dioxide emissions to the atmosphere. In scientific consortium of implementers besides company "Unikat" also entered the Imperial College London (Imperial College London). LLC "Unikat" specializes in the development and research in the field of catalysis and is a resident of Novosibirsk Technopark "Akademgorodok", member of innovation center "Skolkovo".

### **Cluster initiative of the Rostov region**

In the innovative cluster of Rostov region there is started navigation and information center of the Ministry of Transport - one of the first in Russia. The center is drained information about the location, speed and mechanical condition of six thousand passengers and nearly 900 school buses, road and forest engineering. In 24-hours regime members of the center are watching it with GLONASS. In case of emergency in each vehicle equipped with a tracking system, there is an urgent communication with the center button. In turn, it is in

constant interaction with all operational services. Information on road conditions comes to the staff of the center from the meteorological stations on major highways. In the first quarter of 2013 the connection of the center to subsystems of Monitoring Department for emergency prevention and Health Ministries in the region should be complete.

In modern Russia, innovation policy consists of the implementation of cluster initiatives. The advantage of this approach is the freedom of the creative regional initiatives, associated with limited government support and unlimited opportunities for outsourcing in accordance with implemented innovative policies, which basic tools are clusters. Innovation policy, designed for the long term, is a catalyst for the development of not only national, but also the world economy<sup>6</sup>. Innovation policy must take into account features of innovative development of the region, the type of cluster initiatives, particularly in the region of emerging clusters. At the junction of the three aforementioned characteristics, the optimum clustering regional structures are arising, dynamically transforming innovative ideas into innovative products.

### **Findings**

So that cluster could act as a catalyst of innovation development in the region, there should be justified priorities in building of innovative strategy in the region. Development experience of European clusters suggests that this is expedient to use a multilevel approach to knowledge management, taking into account their different types.

Taking into account the characteristics of innovative development of Russian regions and existing types of clusters, it is necessary to construct an innovative policy to optimize the ratio of cluster initiatives and tools to manage them.

Innovation policy and technological breakthrough by implementing cluster initiatives will make possible for Russia to become a leader in the particular (albeit narrow) areas of the technology world. However, it needs to evaluate these initiatives of innovative capacity, reasonably determine the scientific and technological niches and concentrate efforts and resources on their fast development, because time is running out, and if we are belated, these niches will be occupied by other countries.

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<sup>6</sup> Ludmila Voronina. Scientific innovative networks in Russia: experience, problems and prospects / Ludmila Voronina, Svetlana Ratner. - Moscow: INFRA-M, 2010. – p.287.