

**IMPLEMENTATION OF THE STATE RESEARCH  
AND TECHNOLOGY POLICY AS A BASIS  
FOR MANAGEMENT OF THE SCIENTIFIC  
PROCESSES IN THE REGION**

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**Key words:** science, science and technology policy, economic mechanism, regional level.

**A b s t r a c t**

At present, one of the most important lines of state policy is regulation of development of scientific, research and innovative sphere, which is to a large extent reasoned by significant influence of scientific processes on modernization of the present economy.

In this connection, issues of effective management of scientific activity both at the federal and at the regional levels become the most important ones. Inter alia, we speak of creation of system for stimulation of interaction of economic entities and scientific organizations with the purpose of development, testing and implementation of advanced Russian technologies into production processes. Individual regions in the framework of their powers frequently use their own stimulation mechanisms, and as a result of implementation thereof, significant differentiation of innovative activity level of Russian enterprises in various subjects of the Russian Federation takes place.

Peculiarities of state scientific and engineering policy, preconditions and lines of improvement of state regulation of development of scientific activity in Russia are considered in the article.

The author paid special attention to development of recommendations on improvement of this mechanism at the regional level under the current conditions.

**REALIZACJA BADAŃ PAŃSTWOWYCH I POLITYKI TECHNOLOGICZNEJ  
JAKO PODSTAWA DO ZARZĄDZANIA PROCESAMI NAUKOWYMI W REGIONIE**

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### Abstrakt

Jednym z najważniejszych kierunków polityki państwowej jest obecnie regulacja rozwoju nauki, badań i sfery innowacyjnej, która w znacznym stopniu jest uzasadniona dużym wpływem procesów naukowych na modernizację gospodarki. W związku z tym najważniejsze stają się zagadnienia związane z efektywnym zarządzaniem działalnością naukową na poziomie federalnym i regionalnym. Między innymi mówi się o stworzeniu systemu pobudzania współpracy między podmiotami gospodarczymi a organizacjami naukowymi w celu rozwoju, testowania i wdrażania zaawansowanych rosyjskich technologii do procesów produkcyjnych. Poszczególne regiony w ramach swoich kompetencji często stosują własne mechanizmy stymulowania, co powoduje znaczne zróżnicowanie poziomu aktywności innowacyjnej rosyjskich przedsiębiorstw w różnych podmiotach Federacji Rosyjskiej.

W artykule rozpatrzono specyfikę naukową państwa i politykę technologiczną, uwarunkowania oraz kierunki regulacji stanu rozwoju działalności naukowej w Rosji. Szczególną uwagę zwrócono na opracowanie zaleceń ulepszenia danego mechanizmu na poziomie regionalnym w obecnych warunkach.

### **About the features of the state science and technology policy**

Over the past decade was developed a number of concepts on the basis of which the national government build scientific policy. In the works of many contemporary scientists the development of policy, starting from the first stage – task assignment, and to the final – implementation of the measures, represents a conceptual process that requires significant resource costs (GAUDIN 2010).

From an economic point of view the essence of the state research and technology policy consists, above all, in the improvement of forms and methods of management, functions of the state at the level of regulatory mechanisms that enhance the modernization processes through availability of synergetic effect from research and innovation activity at all levels of management.

### **Conditions improve of the state science and technology policy in Russia**

If we consider the changes that have occurred in the Russian science and technology policy in 1990s, it should be noted the following. The economic transformation of those years have required a clear state definition of national priorities in terms of their balance, including in the long run. In relation to science this balance was constantly violated in favor of tactical targets related to the problems of “survival” of scientific organizations. Goals and objectives of research and technology policy were inconsistent with the funds, available at the state level for their implementation. There was no proper coordination of the industrial, financial, credit, tax and science policy.

At the same time, in this period have been accepted and partially implemented solutions such as denationalization and commercialization of individual segments in the field of research and development, accreditation of public research organizations, strategies for the protection of intellectual property and its introduction into the economic turnover. In whole, however, the socio-economic and political changes in Russia, have significantly changed the image of Russian science.

At the beginning of market reforms, science to a lesser extent than other fields, was ready to changes of functioning and management mechanisms. However, the task of restructuring the national science complex already in this period required the development of a new concept of scientific and technological development of the country. In reality, only few fragments of this concept have been identified, and the main task of scientific institutions consisted in looking for a new ways of self-organization.

In addition, almost continuous throughout the 1990s. the process of reorganization of the system of public administration, restructuring of departments, change of the system of delineation of powers between public authorities have led to the absence of proper succession of their activity.

Relatively rapid economic transformation of the 2000s contributed to the rapid development of specific scientific processes. In recent years, was updated the task of strengthening the role of such sources of financing of research and technology and innovation process, as commercial banks, insurance organizations, governmental organizations, non-budgetary funds, foreign sources.

During two recent decades, much interest of economists is raised by additional type of tax exemptions – so called tax credit. It allows industrial companies of some countries to reduce their already charged profit tax by the amount equal to certain percentage from the expenses incurred for R&D. In some countries (Canada, the Netherlands) such tax exemption in increased in proportion to the amount of expenses incurred for R&D, and in others (the USA, Japan, France) – in proportion to increase of R&D expenses as compared with statutory time limit. Certain countries (Italy, Australia) nowadays use both approaches in practice (TODOSIYCHUK 2010).

Also was raised the issue of improving the model of the state tax system in the direction of stimulating of investment and innovation activity. However at the present time the main source of funding for Russian science remains the federal budget (tab. 1) (TODOSIYCHUK 2010).

Research activity of regional significance is often financed using the funds of budgets of the Russian Federation entities and on rare occasions – using the funds of local budgets. However, in many regions, the amount of this funding is negligible.

Table 1

## Provisions for civil science from the federal budget

Provisions	2004	2005	2006	2007	2008	2009	2010	2011
For civil science in current prices, mlrd. rubles	48.7	58.2	76.5	107.3	130.8	166.2	172.9	227.8
In percentage of the gross domestic product	0.29	0.27	0.28	0.33	0.30	0.32	0.40	0.41
In percentage of the federal budget expenses	1.81	1.66	1.79	1.79	1.74	1.84	1.85	2.13

Source: calculated by the author based on the data of Rosstat.

## About regional science-technology and innovation programs

However, in recent years in the majority of the Russian Federation entities were developed research and technology and innovative programs in which are designated the targets and priorities of development of research activities in a particular region, the ways and means of achieving them (*Information-analytical bulletin* 2011).

However, the results of the study showed that not all of these conceptual or policy papers provide a qualitative analysis of the state of research and technology complex of the region, the reasonable determination of the territory specificity and issues, and most importantly, the plans for the development and implementation of effective tools for achieving desired goals.

Indeed, the goals of regional program should be based not only on the availability of resources and opportunities, but on the contrary, it is advisable to form a resource program based on established goals. At the same time there is a need in correlation of regional objectives with the overall concept of research and technology development of the country in the light of specific features of the region, its reproduction, industrial and technological structures (*Information-analytical bulletin* 2011).

In this process should be used, as smoothly as possible, opportunities of federal and research programs aimed at provision of start assistance in technological transformation of the region.

Against a background of reduction of rights of the Russian Federation entities in the field of research and technology and innovative activity management, the cooperation with federal center creates some opportunities for the development of science in the region.

The legal basis of such interaction relate to the formation of economic mechanism of implementation of research and innovative policy, including the provision of subsidies and grants for regional projects out of the federal budget.

However, the analysis of the Russian regulatory and legal framework in the field of research and technological activity shows that with the adoption of the Federal Law of August 22, 2004 No 122-FZ was significantly reduced the role of administrations of the Russian Federation entities in the formation of a national innovation policy.

Changes made by the said Federal Law to the Federal Law of August 28, 1996 No 127-FZ "On Science and State research and technological policy" deprived the Russian Federation entities of right to joint with the federal center powers in the field of formation and implementation of state research and technology policy.

Since 2005, restrictions were partially lifted from the regional authorities. So, now the Russian Federation entities shall have the right to adopt legal acts in the field of scientific and technological activities, create the state scientific organizations, to adopt and implement the scientific, technological and innovative programs and projects of the Russian Federation entities.

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Currently, federal authorities may cooperate with the Russian Federation entities in the following areas:

- participate in co-financing of regional requests for the implementation of innovative projects;
- support the development projects of innovative infrastructure;
- to provide the transference of effective mechanisms of innovations support to the regional level;
- participate in co-financing of regional projects of public-private partnerships in the area of innovation.

For example, in 2010, the major target-oriented programs, in the implementation of which regional scientific organizations took part, are the following: FTP "Research and elaboration on priority development directions of scientific-technological complex of Russia for 2007–2013", FTP "National Technological Base" for 2007–2011. FTP "Development of nanotech industry infrastructure in the Russian Federation" for 2008–2010 (*Information-analytical bulletin* 2011).

Experts believe that in Russia there is no clear consistent mechanism for coordinating activities of federal, regional and local authorities in the process of development and implementation of state regional research policy.

## **About mechanism of effective implementation of the state science and technology policy in regions**

In general, the basic components of the mechanism of effective implementation of the state research and technology policy in the region are the following: Elaborated legislative framework, budget and financial forecasting regulation, programming and development of scientific areas, including various forms of territorial organization of the scientific area, stimulation of the creation and development of scientific and innovative enterprises, inter-regional, cross-border and international cooperation in the scientific area, etc.

The basis of this mechanism involves the provision of conditions, conducive to the stimulation of rational use of available scientific and innovative potential and its development.

As shown, one of the prerequisites for the effective functioning of the regional research and technological system is the presence of a major center for the management of various research and innovation programs, developing a set of measures to strengthen interaction between the key participants of research and innovation process in the region, including providing consulting services for small and medium-sized enterprises (*Information-analytical bulletin* 2011).

In many Russian regions exists the belief that support of innovation business should be ensured through the establishment of regional networks of business incubators. In particular, the creation of a network of business incubators with the involvement funds of regional and local budgets is provided by the programs support to small entrepreneurship in the Nizhny Novgorod Oblast, Kaluga Oblast, Kirov Oblast, Astrakhan Oblast, Saratov Oblast and Krasnoyarsk Krai.

Very often business incubators seek technological parks, growing small innovative firms for them. Technical parks, recently being created consist of business incubators in the project stage. The examples are the industrial parks in the area of high technologies, being created in Moscow Oblast, Novosibirsk Oblast, Nizhny Novgorod Oblast, Kaluga Oblast and Tyumen Oblast. Business incubators are provided in the projects of Russian technology development special economic zones.

In many regions common practice is the creation of business incubators before universities. This is explained by the fact that before universities it was a high potential of ideas and scientific developments for the implementation of which the organizational and financial support is required.

The emphasis in many regional research and technology programs is made on multipolar territory development by supporting of well-established areas, as

well as the formation of new areas of advanced development. Striving for the development of the innovation sector, supported by an appropriate legislative framework, is most characteristic to the two types of regions: with high scientific and innovation potential and the regions in which there is a decline in the rates of development of traditional industries, but exists the potential in highly specialized divisions of knowledge and production.

In particular, the central macro-region is the leader in developing innovations at the expense of the city of Moscow – a major scientific and industrial metropolis. In addition, in the Moscow Oblast are located two technology development areas – Dubna and Zelenograd. As an example, which reflects the formation of advanced development area, we note Povolzhskiy macroregion, combining different in levels of innovation activity subjects. The base for this macroregion are the Samara Oblast, Nizhny Novgorod Oblast and the Republic of Tatarstan. These areas have a significant level of industrial development and high innovative activity.

Their industrial development is associated with the introduction of new technologies and the production of competitive products, the improvement of management and attracting foreign investors.

Thus, the success or failure of the regional science policy in the modern sense is determined not only by the amount of the resources allocated to science and technology, not only by the art of organization of the process of introduction and use of the achievements if the scientific and technical manufacturing process, but by a much wider range of social and economic factors determining the intensity and effectiveness of the research and innovation activity in the society, and experiencing, by back substitution, its growing influence.

Science management at the regional level is the process of formation and implementation of the certain science policy aimed at turning the science into a first-hand productive power for social and economic development of the territory economy with a more complete and broad list of scientific disciplines.

The implementation of this essential and long-term task includes the solution of three mutually complementary main problems of science management (Fig. 1):

- formation of the system of objectives for the research and development activity and for design-and-engineering, the strategic orientation of the regional state policy towards science;
- ensuring the growth of the scientific potential of the region, the number, structure and quality of which would correspond to the needs of the society, as reflected in the system of tactical and strategic objectives of the science development;

– elaboration and realization of set of measures for improvement of the regional science efficiency both, in the application of the existing research potential and, in particular, in acceleration, intensive growth and complete use of the scientific results.

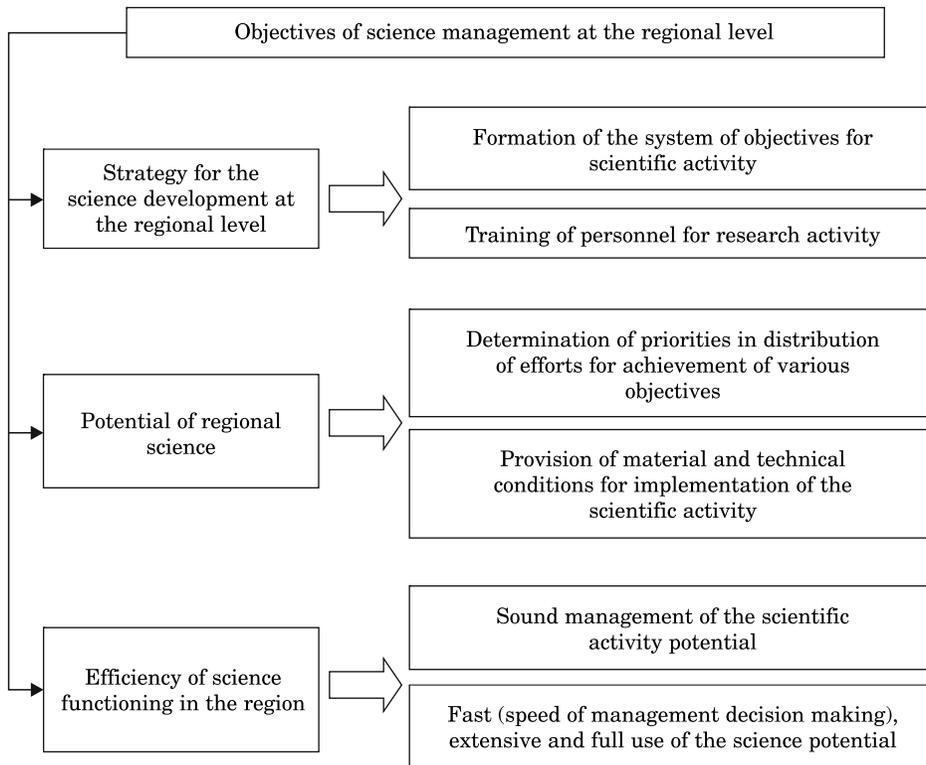


Fig. 1. Structure and content of tasks for science management at the regional level

Each of the mentioned key tasks of the regional research activity management is actually part of the system of objectives of the region and country science policy.

With all the variety of controlling actions available at any level of the research activity management, they can be grouped into four main classes:

- organizational and administrative measures varying within the current legislation, distribution of official rights and duties, etc.;
- economic forms and controls, the diversity and range of which is determined by economic relations and the level of economic development of the country;

- media and management tools, the use of which also results in the direct effect on the technology and technique of scientific production;
- social and psychological control profiles, which vary according to the specific nature of the creative intellectual work in the science.

The set of goals of the state regional science policy can be achieved through the use of a complex of means and measures directing and stimulating the science progress. Understanding and consideration of this important fact, generated by the system properties and the specific nature of the science as the object of control, helps to avoid a number of mistakes in the practice of science policy implementation.

It should also be noted that under the influence of specific circumstances it often becomes necessary to separately consider certain aspects of the object control. This even more strongly determines the necessity to conduct a comprehensive diagnosis of the regional science policy as a whole.

### **Priorities in the implementation of the state science and technology policy**

Projecting the experience in science management into three groups of management objectives: “Strategy”, “Potential” and “Efficiency”, it is possible to make the following general observations.

Experience in solving the tasks of technical support of the science, as well as many other management tasks, has shown that for the success of each such event, the science needs the long-term strategic directives for science policy in this or that area.

Of course, technical support of science is one of the most important measures generating scientific potential. Due to the active search for modern ways of transition from extensive to intensive methods of solving the problems of science development, optimization of structural relations in the potential of scientific activity is of special importance.

Scientific and technical progress is mainly provided through experienced personnel, high level of material and technical equipment, appropriate level of the organizational potential, promoting the flow, generation and implementation of the most promising ideas.

Improvement of the scientific potential components and rationalization of the ratio in the pace and level of their formation is the promising reserve for optimization of the plans and programs for the development of the national science.

At the modern stage of the science development of great importance is maintaining aspect ratio in provision with potential of all the stages of the

“technological process” of the research activity from the fundamental search to their development and practical application.

Observance of the so-called principle of “cycle completion”: provision of concentration of fairly significant capacities of the Russian science in works for realization of the backlog of ideas and science possibilities, now should be under focused attention. This forms another extremely important and promising resource for improvement of the national science efficiency.

Modern science studies any phenomenon in nature and society in a comprehensive manner. In the study of all main issues of science, it is necessary to strive for unification of scientists from various branches of science, with different approaches to the object of research, using different methods of study, different techniques, different conceptual apparatus, etc.

Forecasts form the first stage of the whole work on science management. First of all are prepared forecasts for individual, the most important branches of science and technology. They are the elements of complete forecasts of the entire national economy. Scientific and technical forecasts are always corrected with the new data and new factors.

The forecast subject in science forms its following parts and functions:

- terms of reference (approximate estimation of the time period for settlement of the identified problems and determination of the spectrum of new problems). Here are included the issues of the science structure and interrelation between its various sections;

- social role of science is, above all, the place of science in the system of the society, science and technology, science and culture, that is, science and other social activities;

- problem of scale growth of the science sphere. This problem is considered from the standpoint of the development of the specific system of program activities and choice of the relevant policy providing the development of science and prevention of negative consequences of “spontaneity”.

The important part of the state activity on science development is the nationwide system of scientific and technical information. The main objective of all parts of this system is to systematize the materials characterizing the development of the science or its individual branches. This work is intended to bring attention of scientists and engineers, as well as representatives of organizations, managing the scientific policy, to the new areas of science and especially prospective studies.

Transformation of science into the first-hand productive power does not exhaust the entire significance of science. In the present socio-economic conditions, it appears to be the crucial factor for not only economic, but also political, social and spiritual life, the factor of human culture.

## Conclusion

Summarizing, we can say that the essence of the strategy of research and technology and innovative activity management in regions is reflected, above all, in the contents of regulatory legal documents, developed and adopted at the level of the Russian Federation entities. These documents are now available in most Russian regions.

Thus, the existing economic mechanism of realization of the state research and technology policy in practice, may be able to ensure the effective development of science in the region. However, this process requires the activation of a regional research and innovation policies, creation of an adequate infrastructure and an increased use of existing territorial potential, which includes such factors as geopolitical location, natural, human and information resources, international relations, etc.

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