National experience in funding scientific megascience projects: legal modeling

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Abstract. The research presents the current models of financing mega science projects in the Russian Federation. The work describes the existing in the Russian Federation the system of financing projects megascience. Legal relations in the sphere of financial activities of the states-participants of the projects of the megascience class occupy one of the central places in the system of public social relations arising in the process of construction and operation of large-scale research infrastructures. Emphasizes that Megascience projects are implemented in the public interest. Thus, the main goal of their development is to conduct comprehensive scientific research and breakthrough knowledge and innovative technologies for the benefit of all mankind. Megascience projects solve quite specific problems, and in this concern there is no need for their mass construction, and the high cost makes international cooperation economically feasible in the area under consideration. Legal relations in the sphere of financial activities of the states-participants of the projects of the megascience class occupy one of the central places in the system of public social relations arising in the process of construction and operation of large-scale research infrastructures.

1. Introduction

Russian science at the present stage is the leading participant in the world stage, which of course is facilitated by competitive advantages and accumulated experience, but there are also some significant problems that hinder the development of our state in the scientific and technological process.

Since the beginning of 2000, we have seen the transition of our country to an innovative economy, which is accompanied by a significant increase in the amount of funding for science.

By the Decree of the President of the Russian Federation dated 07.07.2011. No. 899¹ “On approval of priority directions for the development of science, technology and technique in the Russian Federation and the list of critical technologies of the Russian Federation”, priority directions for the development of science, technology and technique in the Russian Federation are approved.

2. Background

One of the main tools aimed at transforming fundamental knowledge, scientific research, including applied research, should be the National Technology Initiative (clause 23 of the Strategy).

¹ CL RF. 2011. No. 28. Art. 4168.
Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" stipulates that the Government of the Russian Federation, when developing a national project in the field of science, should proceed from the fact that in 2024 it is necessary to ensure that the following goals and targets are achieved:

- ensuring the presence of the Russian Federation among the five leading countries of the world carrying out research and development in areas determined by the priorities of scientific and technological development;
- ensuring the attractiveness of work in the Russian Federation for Russian and foreign leading scientists and young promising researchers;
- an outstripping increase in domestic spending on research and development from all sources compared to the growth of the country’s gross domestic product.

The Government of the Russian Federation, when developing a national project in the field of science, needs to solve the following tasks:

- creation of an advanced infrastructure for research and development, innovative activity, including the creation and development of a network of unique scientific facilities of the megascience class;
- updating at least 50 percent of the instrumentation base of leading organizations carrying out research and development;
- creation of world-class scientific centers, including a network of international mathematical centers and centers for genomic research;
- creation of at least 15 world-class scientific and educational centers based on the integration of universities and scientific organizations and their cooperation with organizations operating in the real sector of the economy;
- formation of an integral system of training and professional growth of scientific and scientific-pedagogical personnel, providing conditions for the implementation of scientific research and development by young scientists, the creation of scientific laboratories and competitive teams.

The achievement of the above goals and the solution of the tasks set is possible only in the conditions of proper financing of science. At the same time, it is obvious that the state plays the leading role in the financial support, coordination and management of scientific activities at the present stage. In this regard, it can be argued that funding for science occurs in the public interest, which determines the priority of state budget funding.

Pursuant to Art. 6 of the Budget Code of the Russian Federation budget expenditures are recognized as monetary funds paid from the budget, with the exception of funds that, in accordance with this Code, are sources of financing the budget deficit. The classification of costs is given in Art. 21 BC RF. In this regard, it is interesting to note that in clause 3 of the named article, the costs of financing science are not allocated as a separate section of the classification of budget costs. As subsections, you can find various kinds of applied scientific research in the field of national issues, national defense, national security and law enforcement, national economy, housing and communal services, environmental protection, education, culture, cinematography, etc. Thus, we can conclude that, within the framework of the functional classification of expenses enshrined in the budget code, firstly, there is no mention of scientific research that is not of an applied nature (they will belong to the category of other expenses), and secondly, the costs of applied research are differentiated between different spheres of public life, i.e. there is no unity and interconnection between different areas of applied research. It seems that this problem can be solved by fixing a separate independent section in the classification of budget expenditures, which would provide for expenditures on scientific research of both applied and fundamental nature.

2 CL RF. 2018. No. 20. Art. 2817.
Since the mid-2000s, work has begun on the implementation of measures aimed at increasing the efficiency of the use of budget funds, the so-called result-oriented budgeting (ROB). Science emphasizes that result-oriented budgeting (abbreviated ROB) is a system of organizing the budget process and state (municipal) management, in which expenditure planning is carried out in direct connection with the results achieved. Result-oriented budgeting is a principle that was incorporated into the program of reforming the budgetary system of the Russian Federation, the main goal of which was to reorient all subjects of budgetary activity from the simple use of budgetary funds to activities that would bring real benefits to the state. Today, the ineffective use of budget funds is the main problem of the domestic budget system. One of the directions for the implementation of result-oriented budgeting was the transition to a completely different system of budgeting which is of program nature. In turn, the program-targeted approach to financing implies that the overwhelming part of the budget expenditures of the budgetary system of the Russian Federation (about 75-90%) should be carried out within the framework of state programs.

The latter is especially important in the context of the topic under consideration, since it is within the framework of state programs that funds are allocated to finance science in the Russian Federation.

The advantages of the program method for solving the problem of the development of fundamental scientific research in the Russian Federation are:

- concentration of resources in the main areas of fundamental scientific research;
- ensuring the stability of funding for specific scientific developments and research;
- organizing research work within a specified time frame and ensuring effective control over the targeted use of federal budget funds.

Thus, today budgetary funds for financing science are allocated within the framework of the annually approved budget law. At the same time, state programs approve a plan for the distribution of expenses for several years. This is the way how medium-term planning of budget expenditures for financing science is ensured.

It should be noted that, starting from 2018, all state programs are developed taking into account the goals and targets of national projects. In accordance with clause 3 of the Regulation on the organization of project activities in the Government of the Russian Federation national project is a program, that ensures the achievement of goals and targets, the fulfillment of tasks determined by Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" (hereinafter Decree), as well as, if necessary, the achievement of additional indicators and the implementation of additional tasks under the instruction and/or as referenced by the President of the Russian Federation, the instructions of the Chairman of the Government of the Russian Federation, the Government of the Russian Federation, the decision of the Presidential Council of the Russian Federation for strategic development and national projects of the Presidium of the Council and subject to development in accordance with the Decree.

3. Fundamental problems that require decision-making

Among other things, the Government of the Russian Federation has developed a national project "Science", the implementation of which provides for the allocation of 635.9 billion rubles until 31.12.2024, of which 404.8 billion rubles - federal budget funds, 231.2 billion rubles - off-budget sources. The national project "Science" includes three federal projects with the following amount of funding:

- development of advanced infrastructure for research and development in the Russian Federation - 350 billion rubles.

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3 Approved by RF Government Decree of October 31, 2018 N 1288 (as amended on January 3, 2019) "On the organization of project activities in the Government of the Russian Federation" // CL RF. 2018. N 45. Art. 6947.
development of scientific and scientific-production cooperation - 215 billion rubles;
development of human resources in the field of research and development - 70.9 billion rubles.

However, this order was declared invalid due to the adoption of the RF Government Decree of April 15, 2014 No. 301 "On approval of the state program of the Russian Federation "Development of Science and Technology" for 2013 - 2020." 4

In accordance with clause 2 of the RF Government Decree of March 29, 2019 No. 377 "On approval of the state program of the Russian Federation "Scientific and technological development of the Russian Federation" 5, the implementation of the state program of the Russian Federation "Development of science and technology" for 2013 - 2020 was terminated ahead of schedule.

Among the basic tasks for the implementation of the subprogram are:

- creating conditions for the development of talents and professional growth of scientific, engineering and entrepreneurial personnel, including by expanding the influence of science on society, understanding the value of the results of intellectual work, developing civic investments in research and development, modern social infrastructure and improving the quality of life of participants in scientific technological development with a simultaneous increase in their responsibility to society for the results obtained;
- modernization of the higher education system and creation of conditions for increasing its global competitiveness and export potential;
- ensuring the acquisition of the fundamental knowledge necessary to respond to existing and new large challenges;
- reduction of losses and investment risks in the economy, ensuring end-to-end and balanced support for all stages of the "life cycle" of knowledge and effective use of the initiative and creative potential of the nation, including by supporting multilateral initiatives of researchers, entrepreneurs and society and creating an effective system for the transfer and circulation of rights for the results of research and development;
- ensuring the receipt of significant results, the use of which creates a multiplier effect in the national economy, increases its export potential, improves the quality of life of the population, including through the focus on the development of "end-to-end technologies", the formation and implementation of large commercially attractive (due to long-term financial and regulatory guarantees of the state) complex scientific and technical programs, scientific and technical and high-tech projects;
- elimination of the deficit in terms of infrastructure and information support of scientific, scientific and technical and innovative (high-tech) activities due to its advanced development, taking into account the Forecast of scientific and technological development of the Russian Federation for the period up to 2030 (approved by the Chairman of the Government of the Russian Federation on November 12, 2016) and ensuring easy access to it;
- formation and implementation of national and international infrastructure projects of the megascience class, including creating conditions for the concentration of scientific, scientific and technical, and innovative potential;
- ensuring effective and mutually beneficial integration into the international scientific, scientific and technological, and economic space in order to obtain the necessary competencies and/or financial resources and shift the disciplinary structure both for an effective response to major challenges and for the promotion of Russian technologies, products and services to external markets;

4 CL RF. 2014. No. 18 (part I), Art. 2150.
5 CL RF. 2019. No 15 (part III), Art. 1750.
• development of networking, elimination of barriers and creation of conditions for multilateral financing and investment in scientific, scientific and technical and high-tech projects, scientific and educational organizations, infrastructure of scientific, scientific and technical, and high-tech activities, including public-private partnerships;
• creation of an effective open system for organizing research and development, ensuring high rates of obtaining and mastering new knowledge, a significant reduction in costs, effective interaction and transparent financing of subjects of scientific, scientific and technical, and innovative activities, comfort of services for legal protection and circulation of rights for the results of intellectual activity, elimination of archaic forms of reporting through a complete transition to digital technologies, including distributed ledgers.

Moreover, in the Main directions of activity of the Government of the Russian Federation for the period up to 2024 (approved by the Government of the Russian Federation on September 29, 2018)\(^6\), it is noted that constant scientific and technological development and innovative activity are priority factors for increasing and maintaining the competitiveness of the Russian economy.

In these conditions, the actions of the Government of the Russian Federation are aimed at implementing a set of measures to create a stable and secure information and telecommunications infrastructure, as well as to provide conditions (including the development of legal regulation) for the widespread dissemination of digital technologies. The penetration of digital technologies into various spheres of the economy, as well as the digitalization of state and social spheres (education, health care) will help to reduce transaction costs, as well as increase the level of comfort of the socio-economic environment.

At the same time, constant progress in the field of scientific and technological development will be ensured by the development of domestic and international scientific and industrial cooperation. In addition, the efforts of the Government of the Russian Federation will be directed towards the development of advanced infrastructure for research and development.

In section 2.2.1. of the Main activities of the Government of the Russian Federation "Development of scientific and scientific-industrial cooperation", the emphasis is shifted towards the acceleration of scientific and technological development, which should be ensured by the development of domestic and international scientific-industrial cooperation, including:

• implementation of federal scientific and technical programs and complex scientific and technical programs (projects) on the priorities of scientific and technological development, including the development of advanced genetic technologies in the Russian Federation;
• formation of at least 15 world-class scientific and educational centers based on the integration of universities and scientific organizations and their cooperation with organizations operating in the real sector of the economy in accordance with the tasks of the spatial development of the Russian Federation;
• ensuring the activities of at least 16 world-class scientific centers;
• creation of 14 centers of competence of the National Technology Initiative;
• improving the tools for supporting translational research and organizing the system of technological transfer, safeguard, management and protection of intellectual property, ensuring the rapid transition of research results to the stage of practical application.

Based on the foregoing, we can conclude that the landmark is taken on:

• development of the intellectual potential of the nation;
• scientific and technical, and intellectual support of structural changes in the economy;

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\(^6\) The text of the direction has not been officially published.
effective organization and technological renewal of scientific, scientific and technical and innovative (high-tech) activities.

4. Conclusions
Megascience class projects are implemented in public interest - the main purpose of their development is to carry out complex scientific research and obtain new, breakthrough knowledge and innovative technologies for the benefit of all mankind. Such research is not commercially attractive for business, since, as a rule, it solves fundamental scientific problems and cannot be applied in order to generate profit. All this, ultimately, determines the priority character of state financing of projects of the megascience class.

Megascience projects solve quite specific problems, and in this concern there is no need for their mass construction, and the high cost makes international cooperation economically feasible in the area under consideration.

Legal relations in the sphere of financial activities of the states-participants of the projects of the megascience class occupy one of the central places in the system of public social relations arising in the process of construction and operation of large-scale research infrastructures. Financial law rules regulate a whole range of public relations connected to financial activities in the area under consideration, including budget funding and attracting other sources for the purpose of creating large-scale research infrastructures, establishing and using tax incentives for scientific and other organizations involved in the creation and operation of facilities of global research infrastructure, financial control in the implementation of megascience projects.

In order to fulfill their obligations, the participating states make monetary and natural contributions. At the same time, monetary contributions can be returned to the country's economy in the form of orders for the manufacture of components of megascience facilities, research and development work by scientific organizations.

In order to provide organizational support for the implementation of international megascience projects, the contracting countries traditionally create international intergovernmental organizations (of project and framework types) or national legal entities incorporated in the territory of the state in which the object of the global research infrastructure will be located. At the same time, in Russia, such projects, as a rule (with the exception of NICA), are implemented on the basis of existing budgetary scientific institutions. It seems that the first approach is more effective, since it provides a greater degree of certainty and openness for the project participants, allows redistributing the financial burden already at the planning stage, and relies on a plurality of funding sources.

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