Megascience projects financing in the territory of Russia

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Abstract. The work describes the existing in the Russian Federation the system of financing projects megascience. By the example of legislative regulation, the authors analyze the current situation of these projects and the prospects for their further development. The foregoing allows acknowledging that legal control basis on regulation of megascience projects exists in the Russian Federation. The research was accomplished with financial support of the Russian Fundamental Research Fund in the framework of scientific project № 18-29-15036 mk «Models of legal regulation of unique scientific facilities of megascience class in the national and international level in conditions of technological development of the Russian Federation».

1. Introduction
Megascience has been known since 60s of the XX century. It was considered as scientific bigbusiness, requiring multibillion budget costs. In 1992 UN Worldwide conference on environment and development in Rio de Janeiro admitted that «humanity survives decisive moment of history» in «destructive model of development from environmental point of view» [1]. The same year Japanese Council on science and technology suggested considering «decision of global environmental problems and other general problems of humanity» [2] as megascience target. The foregoing changes intend step-by-step integration of scientific knowledge which is separated at the moment. Starting exactly from this time period Japan has been basically conducting Megascience Forum.

In fact, megascience has become the basis for unification of civilization efforts in search of impactful methodology of sustainable development.

At present time accelerated capturing of innovative knowledge and development of the newest platform of future ideas should be characterized as the period of leadership in research and elaborations which is supported by fundamental factors defining competitiveness of internal economics and effectiveness of security strategies.

2. Implementation of megascience projects in Russia
Modern stage in development of the Russian new type science features competitive advantages of our State as well as not resolved questions preventing quick scientific and technological development of the State in general as far as: substantial potential in some fields of fundamental scientific research prevails and it finds confirmation in some international projects including megascience class facilities; there are hundreds of research and educational centres; starting from 2004 the quantity of personnel under 39 years of age increased on 30%; the problem of irresponsiveness of economics and society to innovations still remains; effectiveness of national research organizations is lower than in other
countries (USA, Japan, the Republic of Korea, the People's Republic of China); there is low joint development of existing researches and use of the latter in practice.

Today scientific and technical potential and its realization become most important targets.

At present time scientific and technical potential and its realization become the most important resource in development of any country. Science development is possible in case of most wide support of the State. Understanding of importance of this process is strategy objective resulting basis for economics, social sector and politics [3-4].

Beginning of 2000s is characterized by transition to innovative economics in Russia which was accompanied by significant increase of science financing.

Decree of the President of the Russian Federation of 07.07.2011 № 899 «On approval of priority directions in development of science, technology and technics in the Russian Federation»¹ defines main ways in scientific and technological sphere.

In order to conduct fundamental research allowing acquisition of new knowledge which may change completely the existing world picture, it is necessary to create unique scientific facilities, requiring huge resource and time spend. The foregoing facilities are characterized as megascience – physical or digital second-to-non base, including distributed facilities.

Russia realizes 6 projects of megascience class. Specifically, in the Address of the Russian President V.V.Putin to the Federal Assembly of March 1, 2018² it was pointed out that basing on the reserve of the previous years it is necessary to rise to a principally new level.

Decree of the President of the Russian Federation of 01.12.2016 № 642 specifies the Strategy³, which defines generating and development of megascience facilities and active incorporation of the Russian research groups in international projects providing acquisition of new competences and resources basing of its own interests.

The strategy is oriented on scientific and technical accomplishment of objectives and national interests of Russia defined in the documents of strategic planning.

It is underlined that the necessity to foster the efforts to the Strategy accomplishment, of the federal and regional authorities, businessmen oriented on organization of conditions for the purpose of implementation of the achieved scientific practices and technologies in the interest of development of the social and economic complex of Russia.

In fact, the Strategy is the basic document facilitating elaboration of the sectoral acts for strategic planning in the field of scientific and technical development of the State, federal and regional programs including planned acts of the State affiliated organizations.

P. 20 of the Strategic act says that within 10-15 years basic directions in the area of science and technology for Russia shall become those oriented for receipt of science and technical results which allow preparing basis for innovation development of the national product and services market, stable position of Russia in the external market and provide transition to: new digital intellectual robotic systems; ecologically friendly power engineering etc.

Decree of the President of the Russian Federation of May 7, 2018 № 204 «On national targets and strategic objectives for development of the Russian Federation for the period within 2014»⁴ entitles the Government of Russia in realization of a national scientific project to build on the fact that by 2024 Russia shall be among 5 leading states in the sphere of scientific research.

It is evaluated that by 2024 the Russian Government shall undertake international research on authoring megascience facilities in the International Center of Neutron Research based on PIK reactor, NICA complex, SSRS-4 (the 4th Generation Specialized Synchrotron Radiation Source), SKIF (Siberian Ring Photon Source).

¹ CL RF 2011. № 28. Art. 4168.
² The text of the Address was not published officially. Legal Research System «Garant».
³ CL RF. 2016. № 44. Art. 6887.
⁴ CL RF. 2018. № 20. Art.2817.
3. Financing of megascience projects in Russia

Today the main financing sources for megascience projects are federal funds. However, financing is performed on the basis of program-oriented and goal-oriented method conducted in the framework of result-oriented budgeting.

At present financing megascience projects is conducted on the basis of the Budget Code of the Russian Federation, Federal Budget, Federal Target Program “Research and development in priority growth areas of science and technological complex of Russia for 2014 – 2020”5, state program “Development of science and technology” for 2013 – 2020”6 as well as some other acts.

Just so the Russian Federation Government Decree of 21.05.2013 № 426 approved budgeting Federal State Budgetary Institution Petersburg Nuclear Physics Institute named by B.P. Konstantinov of National Research Centre «Kurchatov Institute» for financing works on improvement of engineering systems providing “PIK” reactor use and renewal of laboratory complex.

In its turn the Russian Federation Government Decree of 15.04.2014 № 301 «On Approval of the Russian Federation state program «“Development of science and technology” for 2013 – 2020» as one of the main processes of the foregoing program defines accomplishment in our State of big megascience class facilities and one of its directions is organization of international center of neutron research in Gatchina.

The Federal Law «On Federal Budget for 2019 and scheduled period 2020 and 2021»7 provides distribution of budgetary allocations for the program of elaborations on the main objectives development concerning scientific and technological complex of Russia for the period of 2014 - 2020 in the amount of 20 386 343.8 for 2019 and 20 287 849.6 for 2020.

With regards to the sector of «Development of nuclear technologies for implementation of nuclear energy of the new generation» financing was allocated for fundamental research in the field of expected and experimental maintenance of works on upgrading and use of PIK reactor in calculation and estimation of cross section of neutron reactions with transplutonium elements for evaluation of an opportunity for its accumulation in PIK reactor; research of characteristics for mass transfer in the process of isotope exchange between water and hydrogen on water-blocking catalysts [5-7].

At present time there are financial allocations in the following amounts: in 2018 – 39.83 mln rub, in 2019 – 41.43 mln rub, in 2020 – 43.08 mln rub, 2021 – 44.81 mln rub, in 2022 – 46.6 mln rub for the foregoing sector.

The Russian Federation Government Decree of 30.03.2017 № 3638 provides support for elaboration and development of unique “megascience” scientific facilities and huge research infrastructures.

- Decree of Ministry of Education and Science of the RF of 8.10.2013 № 1126 approves Regulation on management of Federal Target Program “Research and development in priority growth areas of science and technological complex of Russia for 2014 – 2020”9.

Client coordinator of the Program is Ministry of Education and Science. The Program is managed by the council board.

The Program is aimed at:

- provision of legal, methodological and informational unification;
- representation at administration bodies of the state client;

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5 The RF Government Decree of 21.05.2013 № 426 «On Federal Target Program “Research and development in priority growth areas of science and technological complex of Russia for 2014 – 2020”» // CL RF. 2013. № 22. Art. 2810.
6 The RF Government Decree of 15.04.2014 № 301 «On Approval of the Russian Federation state program “Development of science and technology” for 2013 – 2020» // CL RF . 2014. № 18 (part I). Art. 2150.
7 CL RF. 2018. № 49 (part 2-6). Art. 7531.
8 CL RF. 2017. № 15 (part 1). Art. 2199.
9 Rossiyskaya gazeta. 2013. № 286.
coordination of financing of experimental and engineering works under the program of basic research: of State Academies of Sciences for 2013 - 2020 (the RF Government Order of 3.12.2012 № 2237-p)\(^{10}\), for long-term period 2013 - 2020 (approved 27.12.2012 N 2538-p\(^{11}\)) as well as in the framework of other Federal Target Programs.

The Presidential Address of February 20 points out that in the Russian Federation in the near future is expected accomplishment of new technological programs and for that purpose it is necessary to accelerate elaboration of advanced infrastructure for accomplishment of these projects. Striking example is launch of PIK reactor megascience class facility in Leningrad region. Within the nearest 20 years it will be one of the most powerful sources of neutrons in the world, which allow conducting unique research in the field of physics, biology and chemistry, and help elaborate new medicines, diagnostic tools, new materials.

4. Conclusion

The foregoing allows acknowledging that legal control basis on regulation of megascience projects exists in the Russian Federation.

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\(^{10}\) CL RF 2012. № 50. Art. 7089.
\(^{11}\) CL RF. 2012. № 53. Art. 8042; 2013. № 13. Art. 1619.