

NEW TECHNOLOGY PRIORITIES: A REASSESSMENT OF OPPORTUNITIES

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The emergence of the concept of national 'pull' projects and the National Technology Initiative can be viewed as a manifestation of the ongoing process of setting various new priorities at the federal level. In this connection, a fundamentally new approach has been suggested in the framework of the National Technology Initiative, with the orientation towards more promising consumer markets where Russia will be able to fill appropriate niches due to the development of new technologies, as well as an adequate infrastructure and institutions necessary for their support.

Over recent months, activities have been underway at the government level, which are aimed at creating adequate mechanisms for the selection and actual implementation of technology priorities in accordance with the new concepts of national 'pull' projects (otherwise known as 'national projects with highly innovative components') and the National Technology Initiative (NTI).

The idea of 'pull' projects was initially put forth in August 2014; so far, a methodology and practical procedures have been elaborated for project selection, as exemplified by projects in the power engineering sector and advanced industrial technologies. In this connection, national 'pull' projects are understood not as being technologies per se, but comprehensive intersectoral programs that include a set of interrelated projects aimed at modernization of the core sectors of the national economy through technological upgrading. Such projects are expected to yield considerable economic effects over a 10–15-year period. The definition of and approaches to 'pull' projects are derived from the already well-known mechanisms; evidently, the novelty of the concepts depends on the actual parameters applied to the description of the economic results to be achieved in the course of modernization. These are the indicators of GDP growth, exports, import substitution, technological sovereignty, life expectancy, pollution and environment protection. These parameters are simultaneously applied as the criteria for selecting the most promising technologies. So, this can be regarded as yet another attempt at improving the mechanisms applied in the selection of the most appropriate technologies and their marketing and promotion, by way of elaborating and implementing some new programs.

However, in late 2014 this concept gave way to another one – the new concept of 'national technology initiative'. The term *National Technology Initiative* (NTI) was for the first time used by RF President Vladimir Putin in his Presidential Address to the

Federal Assembly in December 2014. It was he who announced the launch of NTI, explaining that this was the initiative designed to help determine the development goals and priorities for the next 10–15-year period¹. Although similar, at a first glance, to the idea of 'national pull projects', this new concept embraces a more comprehensive task: that of creating a mechanism capable of bringing the global goals of this country's economic development in conjunction with state-of-the-art technological priorities and the mechanisms of their implementation.

So far, several versions of NTI and its components have been elaborated. The most widely discussed is the concept put forth by the Agency for Strategic Initiatives (ASI), which is actually responsible for its development. At the same time, their own visions of the concept of NTI have been suggested by the Russian Academy of Sciences, the RF Ministry of Education and Science, and the RF Government Expert Council.

In the draft of *'The Fundamentals of the National Technology Initiative'* elaborated by the Russian Academy of Sciences, the main focus is placed on the task of ensuring Russia's parity on a global scale with the countries that are leaders in world technological progress; this parity would be impossible to achieve without developing fundamental science: '...the contemporary status of fundamental science determines the situation in business in the long run'². On this basis, substantiation is provided for the goals of import substitution, reindustrialization, and improvement of the methodology applied in setting the science and technology priorities. The latter must be geared to the existing demand for final products and services. The advantage of this approach, according to its authors,

1 Presidential Address to the Federal Assembly. 4 December 2014. See <http://www.kremlin.ru/news/47173>

2 Osnovy natsional'noi tekhnologicheskoi initsiativy [The Fundamentals of the National Technology Initiative]. Russian Academy of Sciences. Information and Analytical Center Nauka [Science]. Version as of 22 May 2015. P. 7.

is that it makes it possible to determine, in the phase of planning, society's demand for specific types of products and services. Thus, the business community will be able to get information on the most advantageous directions of activity and possible areas where public-private partnerships could be set up¹. The draft prepared by the Russian Academy of Sciences determines seven priorities for science and technology development, represented either by entire industries or by more narrow specific technologies and science-and-technology branches – power engineering, national defense and national security, pharmaceuticals, medical technologies, food industry, information technologies, nanomaterials and new chemical substances².

In terms of institutional development, the approach suggested by the Russian Academy of Sciences implies the establishment, under the RF President, of a science and technology development council, where the Russian Academy of Sciences will be assigned the important function of elaborating the doctrine of technology development and other documents to be adopted at the federal level. The implementation of the NTI, according to the Russian Academy of Sciences, will also envisage some organizational changes, including such relevant innovations as the transfer of some of the national research universities and branch universities to the related branch ministries, government academies of sciences and state corporations³. Among the new structures to be created, a central place should belong to research and development consortiums.

The RF Government Expert Council has suggested a draft concept of the development and implementation of the NTI, where not only its definition is offered and main implementation phases outlined, but also the necessary resource base and an analysis of the risks involved are suggested. The Expert Council views the NTI as a comprehensive program aimed at ensuring Russia's global competitive capacity in its dealing with other developed countries in the most promising sectors of the world economy and specific segments of world markets. For this lofty goal to be achieved, the Expert Council also suggests that research and development consortiums should be established⁴. These research and development consortiums will unite organizations of various types and belonging to differ-

ent sectors of the national economy for the purpose of implementing priority science and technology projects.

Thus, the concepts of the NTI put forth by the RF Government Expert Council and the Russian Academy of Sciences are alike in many of their aspects; they are largely based on the modifications of approaches that have been traditional for Russia's policy in the sphere of science and technology. At the same time, the management model suggested for the implementation of the NTI by the Russian Academy of Sciences implies some significant alterations in the system of relations between the academic science and science based on higher educational establishments.

As for the standpoint of the Agency for Strategic Initiatives (ASI) with regard to how the NTI should be understood, it is rather different. According to the ASI, the NTI implied first of all the formation of new, network-based consumer markets: 'the selection will be done with due regard for the basic trends in world development, on the basis of priority network technologies centered around man as the end consumer'⁵. It is expected that, in 10–20 years, the volume of these markets should be in excess of \$ 100bn, and Russia has a chance to win a respectable position in that sphere⁶.

In order to precisely identify such markets, experts began detailed assessment of the following four inter-related parameters was started: 'markets', 'technologies', 'infrastructure', and 'institutions'. In other words, in order to enter the market of the future, systemic solutions are necessarily aimed at determining the appropriate key technologies, the alterations to be introduced to the existing norms and rules, and the needed finance and cadre development measures. These are to be selected and substantiated on the basis of various new methods, including foresight⁷ and roadmaps. It is typical that, by the moment of the launch of 'foresight' (in May 2015) with the participation of about 700 experts, a total of nine 'markets of the future' had already been preliminarily selected. These are divided into three groups:

- those that have to do with national security and its provision with resources (food, energy and security market);

1 Osnovy natsional'noi tekhnologicheskoi initsiativy [The Fundamentals of the National Technology Initiative]. Russian Academy of Sciences. Information and Analytical Center Nauka [Science]. Version as of 22 May 2015. P. 7.

2 Ibid, p. 8.

3 Ibid, p. 24.

4 Draft of the Concept of developing and implementing the National Technology Initiative. RF Government Expert Council. 16 March 2015.

5 <http://asi.ru/nti/>

6 D. Peskov: Nas ozhidaet korennaiia perestroika osnovnykh otasley [We Are to Expect a Fundamental Restructuring of All the Core Industries] // Kommersant, 1 April 2015. See <http://www.kommersant.ru/doc/2698958>

7 Foresight is a system of methods applied in expert estimations of strategic directions of socioeconomic and innovation development and breakthrough technologies capable of significantly influencing the national economy and society in the medium and long-term perspective.

- those that have to do with the development of the transport system (automobile transport, air transport and sea/river transport);
- the markets that are currently undergoing a revolutionary technology upgrading ('digital' health market, new finance and neurocommunications)¹.

An approach that somewhat resembles this one was applied in 2009: then, RF President Dmitry Medvedev announced the selection of 5 'strategic modernization vectors' for this country², which later laid the foundation of the Skolkovo project and the clusters created in its framework. In the case of the NTI, the selection of these nine markets was based on two main criteria – the prospects for development in a global context, and the availability in this country of companies (or people) prepared to become leaders and assume the responsibility for developing specific branches and ensuring entry into new markets. Consequently, the NTI will be considered to be implemented in the event of appearance of Russian companies that will become leaders in the global technologies markets in 2025–2035. In spite of the inevitable sad allusions and similarities in rhetoric (in 2009 and in 2015 alike, we hear about the numerous mistakes committed in the management of the innovation sphere), some positive components can also be noted in the current approaches to the implementation of the NTI. First, the switchover to personal responsibility is important; second, the importance of horizontal connections is emphasized; third, the

1 Natsional'naia tekhnologicheskaiia initsiativa: 'neudobnye' voprosy i chestnye otvety [National Technology Initiative: 'Uncomfortable' Questions and Honest Answers]. Foresight Fleet Materials, 12–16 May 2015. ASI, RBC, Foundation for Promotion of the Development of Small Businesses in the Field of Science and Technology. P. 5.

2 D. Medvedev. Rossia, vpered! [Russia, Forward!] 10 September 2009. <http://kremlin.ru/events/president/news/5413>

system remains open – the discussion of prospective market may be continued in 2016.

At the same time, the accepted approach to the elaboration and implementation of the NTI makes its success dependent on some poorly predictable parameters, namely:

- 1) correct prediction of the future, which relies on the art of selecting and appointing the right experts,
- 2) the possibility to identify some truly remarkable and charismatic leaders,
- 3) the ability to launch the implementation mechanisms and the movement towards the target market niches.

Thus, the emergence of the concept of national pull projects and the National Technology Initiative points to the currently increasing number of technology priorities. If properly managed, they will be synchronized; if not, they will be duplicated. Synchronization is always rather difficult to achieve, because each project is usually backed by a group of interests. Besides, in a situation when significant budget cuts in the field of science, technology and innovation are to be expected³, it does not appear to be feasible to launch a multitude of high priority projects. If an entry into new markets is currently perceived to be the top priority, the process of selection of technologies and fields to be supported should take place in the framework of that particular concept. However, this does not rule out the possibility to take into account the most promising 'pull projects' capable of yielding the highest economic effect. ●

3 Thus, in particular, in the framework of the Government Program 'Development of Science and Technologies in 2013–2020', it is planned that total expenditure in 2016 should be cut by 28.9%, the expenditure allocated to the pharmaceutical and medical industry – by 31.4%, and that allocated to the shipbuilding industry – by 61.6%. Source: P. Netroba. Komu otrezhut 16% [Who Is To Be Cut 16%] // RBC, 21 May 2015. P. 9.