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AREAS OF PRIORITY DEVELOPMENT AND TECHNOLOGICAL CHANGES IN THE RUSSIAN ECONOMY

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ABSTRACT

To confirm the status of the post-industrial power, Russia must ensure faster growth of the economy based on development of scientific and technological capacity. The author of the opinion, according to which Russia should pursue a strategy that takes into account the possibility of commercialization of scientific and technological achievements of world level. Own results in the field of research and development activities are open, according to the author, the term technological cooperation with foreign companies, including in the area of commercialization of belonging to different parties, but complementary discoveries. To solve the problem of advanced development proposed strategies: leadership, catch-up, ahead of commercialization. According to the author, the greatest realism is different anticipatory strategy for commercialization of scientific and technical developments. This strategy can be implemented on the basis of public-private partnerships with innovative companies, mastering the "breakthrough" technology with state support. This will reduce the risk of private investment in the new production, increase the participation of private capital in the development of research and development, strengthen the links between science and industry, state action to shift towards support for projects involving the leadership of the domestic manufacturer of innovative products.

JEL CLASSIFICATION & KEYWORDS

■ O38 ■ RAPID DEVELOPMENT ■ TECHNOLOGICAL CHANGE ■ SCIENTIFIC-TECHNICAL POLICY ■ NANOTECHNOLOGY ■ ECONOMICS OF INNOVATION

INTRODUCTION

During the crisis the world economy, when the decline in production has affected even the largest companies with a monopolistic position, and marketing problems have arisen in almost all market segments, from yesterday's outsiders a unique opportunity to gain access to modern technologies for solving a breakthrough for the high cost of advanced post-industrial countries. Chances exit out to the leading positions are approximately equal for all participants.

Directions of development

In growing sectors of comparative advantage such as Russian IT companies, is deprecated shouldering less productive assets. For the successful fulfillment technological breakthrough outsiders correctly assessed the long-term direction of technological development outstripping way to put them into production on an industrial scale.

The result is rapid development depends on whether the predicted growing opportunities before the corresponding signals of the market or not. The calculation to support a previously mastered production does not allow to create competition in dynamic markets and form the basis technological breakthrough. Necessary to ensure rapid realization of new scientific knowledge into production.

To solve the problem of accelerated development should develop and adopt a competitive strategy of scientific and technological development. In our view, under the circumstances, Russia should pursue a strategy that takes into account the possibility of commercialization of scientific and technological achievements of world-class development. For such a strategy is appropriate prerequisites: the availability of scientific personnel capable of working in the field of exploitation of fundamental discoveries, experience of participation of Russian scientists in international scientific and technical cooperation; corporations with significant potential for scientific and technical development teams of scientists with expertise in engineering design of high quality.

For the practical implementation of the prerequisites of advanced development needs strong scientific and technical policy of the state. The presence in the Russian-developed basic science is important for the perception of others\' discoveries of their own accumulation of backlogs in the relevant areas of knowledge and building human capacity for applied research and experimental development. All this favors the combining of foreign and domestic inventions that may be critical for the commercialization of scientific and technical developments, giving them unique properties.

In addition, having our own results in the field of scientific research and experimental development offers the prospect of a real technological cooperation with foreign companies, up to the joint commercialization of the parties belonging to different but complementary findings. It seems that this is the most reliable way of familiarizing with promising technological developments of post-industrial countries that are part of the leaders of the world economy. Other, perhaps more rapid investigation can be achieved by bringing these countries in foreign direct investment. In this case, is more likely the arrival into the country technologies, embodying already commercialized discoveries.

An important element of the strategy advanced by the development of commercialization of scientific discoveries is the implementation of independent research and development activities. If such developments take place in the country in research centers belonging to foreign companies, the reasons for sharing discoveries with local companies, they do not arise. Most of these centers are loaded with fragmented development, while integrating the results of scientific research and experimental development occurs in countries where the central government based multinational company.

For the strategy of accelerated development and commercialization of discoveries requires not only scientific and research base, but also a powerful industrial and financial infrastructure. To conduct a successful policy of national economic development requires a clear definition of branch strategies. Taking into account the resources available and the level of scientific and technological capacity for each industry must choose either leadership strategy or a strategy of dynamic catch-up, or, in the absence of the necessary groundwork, advance the commercialization strategy.

Priority should be given to the development of industries with good prospects for sales of new products, including the state-controlled markets, including the procurement markets

of the state and state corporations. Due to this can be achieved economies of scale in production, and depreciation of new products will contribute to the development of the emerging technological system in its own way. In Russia, there are competitive industry that can produce demand for new technological order: nuclear, aviation, shipbuilding, rocket and space, electronics, etc.

For example, a range of areas of application of nanotechnology in aerospace engineering include: nanomaterials, nanocomposites, nanostructured alloys, nanocoatings, nanofilms and nanomembranes, fibers based on carbon nanotubes, nanocatalysts, nanogeli, high-temperature superconductors, nanoelectronics, nanophotonics, nanomanipulators.

The massive demand for nanoproduction can show such basic industries of the domestic industry as chemistry, metallurgy, fuel and energy, rail transport, and agriculture.

In the example of the use of nanotechnology industry can serve as the serial production unique to the Russian steel grades with a twofold increase in the characteristics of the exploited, such as weldability and cold resistance. New materials are intended for the construction of structures for the development of oil and gas fields of the Arctic shelf, used in extreme conditions (up to-50o C), shipbuilding, oil and gas and engineering industries.

In the field of oil and gas industry is a promising direction nanokataliz. New components will handle crude oil is much more efficient, faster and at lower cost. Also, using nanotechnology oil and gas industry receives a number of sensors and self-healing materials, capable of protecting the surrounding area from spills.

New technologies for processing light hydrocarbons (special catalytic reactor with nanoporous membranes) will contribute to the fulfillment by Russia of the obligations assumed under the Kyoto Protocol. It is estimated that by using these technologies can recycle up to one third in Russia released into the atmosphere associated gas (ie, about 10 billion m3 per year), which will provide an additional amount of cost of goods and services up to 200 billion rubles a year.

An example of another direction in which Russian industry has promising beginnings and competitive advantage, can serve as ultra-high brightness LED production used for lighting homes. For its realization it is expedient to encourage legislative replacement of incandescent lamps to LEDs, through which a 2012 Russian market of LED lighting could reach 70 billion rubles (Fursenko, 2008).

To implement the strategy of leadership is important win and retain the leading position in the manufacture of instrument-making framework for nanotechnology. Despite the backlog in this area and achieved commercial success, a nanosystem technology equipment available in the current list of "breakthrough" technologies. Meanwhile, Russia launched production required in the field of nanotechnology unique equipment, including ultrahigh complexes nanolaboratory probe, scanning probe microscopes. Must be set the task of consolidating Russia's leading positions in this area, highlighting the production of equipment for nanotechnology in the priorities of the state scientific-technical policy.

Requires analysis of patent databases nanosystem technology to advance the acquisition of some foreign licenses. The State should be invited to pay the full cost of domestic authors (individual inventors and small research institutions) of promising developments in their readiness for the patenting of the authors agree with the government selling licenses for these developments.

Deserves special attention for nanometrology instrument and holding the corresponding change in the metrological provision of production (Federal Agency for Technical Regulation and Metrology, 2007). The loss of special technological engineering is the need to purchase the entire set of process and control equipment abroad. Its cost is very high for certain types of equipment (photolithographic installation), it can reach 8-10 million dollars per unit (The Ministry of Industry and Trade of Russia, 2007).

For the practical implementation of priority development areas, play an important role between the manufacturers of equipment for the latest technology and its users. Continued weakness in the Russian interbranch coordination of innovation makes use of the mechanisms of convergence of technologies and related management practices (Lepskiy, 2008).

To accelerate the development of new technologies and the need to reduce costs coupled clustering technology industries. Leading role in coordinating innovation processes in clusters of technologically conjugated productions are big companies and business groups. They are system integrators of the innovation process, which takes place at different levels of the innovation system. Large high-tech companies can take on large-scale financial and technological risks in developing new technologies. These companies control the distribution channels, are the owners of formats and standards, that becomes an important competitive advantage in high technology markets. In addition, they create and develop technology platforms. Lack of development of these companies - the main weakness of Russia's strategic national innovation system (Dynkin, 2009).

Deficiency of integrating the companies, narrow range of strategically focused on the technological development of private investors, the weakness of the financial system, lack of public funding of large-scale modernization projects - these and other difficulties faced by the establishment of the domestic production of complicated products of mechanical engineering, have brought about the emergence of public corporations, covering the key stages research and production cycle. The intrinsic state corporations options coordination of economic activities, focused on the issue of serial production, can be combined with softer options of integration in the form of various network structures.

Through leadership in systems integration is possible to implement a strategy of advanced development and commercialization of scientific and technical developments. Participation in innovation-led foreign leaders can be a means of system integration. In order not to remain in the role of a subcontractor, you need your own research and development on cutting-edge areas.

Modernization of domestic industries will be an incentive to find promising scientific and technical development and support of scientific research. However, for a long time, especially at the stage of basic research the key role of the production of convergent technologies will be preserved for the state. The system of public institutions of the national innovation system should provide the minimum conditions of formation and development of innovative economy: subsidizing the costs of intellectual property protection for inventions and the development of domestic and foreign origin, the admission of insurance and pension funds in the implementation of venture projects under the state guarantees, subsidies for scientific technical libraries,

information networks and databases of scientific literature, expert support and experimental facilities, technology centers and parks for communities, accounting for all expenditures on research development, modernization of production and introduce new technologies in the production costs.

At the stage of the commercialization of new technologies is particularly important public-private partnership. In addition, partnerships may be a list of "breakthroughs", which allows the development of innovative enterprises rely on the support of the state, substantially reduce the risk of private investment in advanced manufacturing. One of the main public-private partnership in support of new technologies are government purchases.

Much attention is the state of innovation in the economy due to the need to update and strengthen the links between science and industry. Among the reserves - the offset in the direction of government activity to support projects with domestic leadership in system integration (RUSNANO, 2009).

One of the weaknesses of national innovation system is the low activity in the area of commercialization of scientific research. The principal contribution to changing this situation can give training on the commercialization of scientific developments, which should be a separate area in science and technology policy. This is possible only if close links with the educational institutions of science and business, to communicate with enthusiasts of system integration and commercialization, the admission to their mentality and values.

Adapting the system of higher education to the needs of the economy of innovation involves training of managers and engineers with a broad outlook of knowledge in the field of scientific and technological progress and focused on the maintenance of continuous innovation. To do this, along with government support of basic research at universities to encourage teaching staff of research institutes, research units of corporations.

Conclusion

For realization of the state policy in the field of scientific and technological development, is the appropriate prerequisites: the availability of scientific personnel, the experience of participation of Russian scientists in international scientific and technical cooperation; corporations with significant potential for scientific and technological development, teams of scientists with expertise in engineering design of high quality. In the framework of science and technology policy should create conditions for the combination of foreign and domestic inventions in joint development projects, give them a unique quality and commercialize the results.

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