

# Organizational-economic conditions of maintenance of the accelerated development of machine-building branch

*Olga Vorontsova*<sup>1,\*</sup>, *Albert Isaev*<sup>2</sup>, and *Dmitry Stratan*<sup>1</sup>

<sup>1</sup>Polytechnic Institute, DGTU, 347900 Taganrog, Russia

<sup>2</sup>DSTU, 344000 Rostov-on-Don, Russia

**Abstract.** The article analyzes and assesses the current situation in the engineering industry of Russia based on statistical reporting data. Conclusions are made about the impact of key economic indicators on the situation in the industry. The main problems on the way of innovative development of the machine-building industry have been identified and organizational and economic instruments for their solution have been proposed.

At the present stage of development of the world economy in conditions of severe competition in the economic, financial, technological and military spheres. the issues related to the innovation development of the leading sectors of the Russian economy acquire special urgency. The development of Russian industries in previous years was characterized by a lack of a clear state impact on the structure of production systems and insufficient attention of the country's leadership to the formation of industrial policy, which subsequently affected the development of Russia's main industries, primarily in engineering, where the degradation process took absolute character, and as a result, by the beginning of the 2000s, a significant part of the production potential was lost and not restored up to the present time.

The development of machine building in Russia in the period 1990-2014. is indicative and reflects all the vicissitudes associated with privatization, the decline of the economy in the 1990s, the succession of financial crises and the increase in production in recent periods (2010-2014). All this led to the loss of competitive positions in the world market and the growth of imports in the category of "machinery, equipment and vehicles." Currently, the enterprises of the industry under review are under considerable pressure from outside, connected with economic sanctions from the European Union and the United States. Also, the depreciation of the national currency imposes additional restrictions on the development of the sector under consideration. The existing conditions from one country can be regarded as threats to the existence of machine building in our country, on the other hand, there are additional opportunities and competitive advantages in comparison with western commodity producers.

All of the foregoing causes the urgency of studying the state and the basic laws of the development of engineering in Russia. The relevance of the chosen research topic is also confirmed by a large number of works devoted to the state and prospects of machine build-

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\* Corresponding author: [gov555@inbox.ru](mailto:gov555@inbox.ru)

ing in our country, among the authors dealing with this problem can be identified: Abramyan S.I., Bodrunov S.D., Voronina V.M., Dubrovina N.A., Korosteleva E.M., Mukhanova I.V., Solovenko I.S., Timofeev D.N. and others.

Summarizing the foregoing, we can formulate the purpose of writing this scientific article, which is to conduct an analysis of the state and trends of engineering in Russia.

In modern conditions, the overwhelming majority of the branches of the machine-building complex of Russia are characterized by such features as technological backwardness, a high level of depreciation of fixed assets, low indicators of labor productivity and science intensity.

The stable tendencies of growth of imports of machinery and equipment from abroad that were observed in the post-reform period led to the fact that at present the modernization of the domestic industrial complex is carried out mainly on the import technological basis. This situation creates for Russia the threat of falling into technological dependence on the supplying countries of machinery and equipment needed by the domestic industrial complex. The technological re-equipment of industrial enterprises can not be realized without a modern machine-building industry. The competitiveness of the entire economy depends on the extent to which this sector is capable of generating and absorbing innovations. In connection with this, an important issue is understanding the obstacles to the development of innovative processes in the domestic engineering industry. Knowing their specifics, it is possible to develop a set of measures to intensify the process of creating and introducing innovations in the domestic machine-building industry and create favorable conditions for the sustainable development of the national industrial complex.

At present, the machine-building industry of Russia is not competitive on the international market, which is largely due to its technological gap from the industrialized countries. One of the main reasons for this situation was the shortcomings of the existing methods of regulation in the machine-building sector of the country, for the modernization of which it is necessary to accelerate the development and implementation of a set of measures that have been tested by world practice in pursuing a purposeful industrial policy and innovation policy. Accounting for international experience will help to clarify the indicators for assessing the development of innovation activities and determine the measures necessary for the functioning of the Russian innovation system.

Modern history has proved that innovation activity is the foundation for the competitiveness of countries in the world economy. The relationship between competitiveness and innovation comes from the definitions of their concepts. Competitiveness can be understood as "the ability of a country or an enterprise to produce goods and services that can compete successfully in the world market." In turn, innovation can be understood as "... the introduction of a new or substantially improved idea, product, service, process or practice that is designed to produce a useful result." Thus, innovation activity can be considered as a means of increasing competitiveness.

Currently, industrialized countries view innovation as a necessary basis for competitiveness in the global economy. Every year, these countries increase the costs of research and development in various industries. In Russia, however, there remains a very low level of spending on the creation of new products, the development and introduction of new equipment and technologies, which causes the low competitiveness of the domestic manufacturing industry. Innovative policy, which spreads with the rapid growth of the role of foreign trade and foreign direct investment, is based on the concept of dynamic competitive advantages that determines the need for the country's institutions, including the state, to actively form the "image" of the country's future economy and the ways of its practical implementation oriented on the formation of competitiveness of industrial enterprises. These conditions include: the quality of labor resources; the level of scientific research in the field of technology and technology; the existence of links between industrial firms, higher educa-

tion institutions and research institutes; the ability to creatively master foreign technologies; speed of distribution in the country's industry of technological and other innovations; capacity of the domestic market and the level of requirements of domestic consumers of industrial products to its quality characteristics; availability of technologically related and geographically close complexes of enterprises producing products that are in demand in foreign markets. As a result, the countries that have achieved the most impressive success in recent decades are distinguished, on the one hand, by a highly developed education system, by the desire to raise its level, on the other hand, the level of support for research and development (hereinafter - R & D) and innovation. In the field of R & D, the content of innovation policy is determined by: financial support by the state shock of fundamental science and scientific research; the creation of innovative structures that ensure the link between science and production and the commercialization of scientific developments; implementation of R & D programs with the participation of enterprises and scientific organizations; creation of the most favorable conditions for the activity of innovation-active enterprises.

According to the results of 2015, according to the state statistics, the dynamics of production in the three branches of machine-building declined by 8.9%. The main reason for the negative dynamics is a significant reduction in domestic demand. Along with this, a significant negative impact on the production results of the machine-building complex in 2015 was due to high interest rates on loans, as well as a sharp increase in ruble prices for materials, and primarily on steel, which was due to the striving for domestic prices to export parity.

The situation in the Russian engineering industry remains ambiguous. It is obvious that the industry is going through difficult times. It all began with a weakening of investment activity in the market, which led to a drop in production rates. Stabilization of the situation and the resumption of production rates in the industry are difficult to forecast. The general conclusion on the industry can not also be due to multidirectional trends in each segment of the industry. A number of segments (sub-branches) fell under state support programs, and production volumes were kept at pre-crisis levels. As you know, engineering for fundamental reasons is sensitive to any changes in investment activity. Industries that were left without support and working exclusively on market laws showed less optimistic results.

Therefore, the decline in production is due to the negative factors prevailing in the financial system of the country. First of all, this is an increase in interest rates on loans and a rise in the cost of purchased materials, including rolled steel due to the fall of the ruble. Imports replacement, of course, had a positive effect on the dynamics of the development of individual sub-branches of machine building, but it did not so much lead to an increase in sales of Russian equipment, but exclude the factor of competition associated with the purchase of imported products.

It is obvious that the way out of the systemic crisis that has developed in Russian engineering industry is possible only if the following systemic negative factors affecting the situation are systematically overcome:

- Russia's technological backwardness from advanced countries, primarily in the machine tool industry;
- Inadequate structuring of a number of industries within the machine building complex itself;
- low competitiveness of Russian machine-building products in the domestic and foreign markets and low investment attractiveness of machine building (as a consequence of the above factors);
- The absence of internationally accepted standards of products.

The primary measures to overcome the crisis in Russian industries are the modernization of the management of innovations, the development of a set of effective management

decisions in order to increase competitiveness, since it is the improvement of the system of management of innovation processes and its elements in the industry that allows raising the level of innovation activity of enterprises of the industry.

At the same time, the urgency of the issues of innovative development of the machine-building industry is caused by a number of factors, such as:

- Machine-building is a branch of manufacturing industry, which determines the level of development of other industries, providing them with machines, devices, equipment, vehicles, and consumables.

- The machine building industry has a rather large share in the structure of manufacturing industries.

The complexity of the development of machine building in Russia is that in the implementation of the strategic goals of the country's entry into a post-industrial society in the short term it is necessary to simultaneously solve three main tasks:

- intensive modernization of machine building and its technical re-equipment and, first of all, priority-related sub-seismic; it is important in the future to avoid the technological dependence of Russian engineering (primarily, the defense industry) on foreign suppliers of technology and equipment;

- training and retraining of personnel potential with the formation of a new engineering, technical and managerial generation capable of providing innovative development of machine building;

- creation of conditions for increasing the investment attractiveness of machine-building enterprises and ensuring the inflow of private investment in engineering.

The Russian machine-building industry as a domestic supplier of machinery and equipment to manufacturing enterprises as a basis for transition to competitive production needs to find ways to organize an effective financing of the renewal of fixed assets, including modernization of existing equipment in the framework of implementing sectoral plans for import substitution, improving the use of production capacity. The situation in the industry remains rather ambiguous, it is impossible to solve it only with the help of market mechanisms, and experience shows that state support is not always a panacea either. A set of measures is needed, including both state participation, market models, and a well-developed economic system for the development of the machine-building industry. The introduction of this model should be based on an adequate real and statistical assessment of the scale of the activities of the machine building industry; assistance to developers and equipment manufacturers in the creation and development of new domestic technologies and their introduction into production, including through public-private partnerships; complex support for the export of high-tech products in the machine-tool industry and in the oil and gas, heavy, power engineering, electrical and cable industries.

One of the foundations for the implementation of innovation policy should be the import substitution of equipment, as this mechanism, successfully tested in other developing countries, as well as some sectors of the domestic economy, has significant positive externalities in addition to stimulating innovative development.

Summarizing the above, we note that in the countries that occupy a leading position in the machine-building industry, research and development is constantly being conducted. Manufacturers of machine-building products closely cooperate in the development of new technologies with universities, research institutes and laboratories. Every year the expenses of the state and private enterprises for fundamental science grow. The research is financed by the enterprises themselves, the state, and also through investments. The governments of countries specially develop programs to attract investors, and establish preferential taxation for corporations that carry out state or proprietary R & D programs. Also in the countries much attention is paid to the education system, which should train qualified specialists. Russia on the innovative development of machine building lags far behind the developed

countries, this is due to a number of problems: a strong deterioration of fixed assets; the deepest specialization of production; aging of staff who are carriers of technology; limited access to financial resources; the underdevelopment of the sales system, i.e., the lack of orientation in the production of products to the level of the world market. Together, these problems lead to a technological lag in Russian engineering and, as a result, noncompetitiveness of its products in world markets.

As follows from international experience, the functioning of Russia's innovation system requires measures that stimulate the development of research and development [2]:

- formation of an attractive environment for research and development, in particular, to enhance the prestige of scientific activity, to bring the income of an effective scientific worker to a level above the industry average;
- creation of a modern engineering base for research and development, which will include not only a corps of qualified specialists, but also relevant equipment;
- Creation of a common engineering base, including state scientific research organizations, universities, high-tech small enterprises;
- formation of an attractive environment for the work in Russia of foreign specialists in the field of research and development;
- introduction of tax and credit incentives for companies engaged in research and development;
- Creation of concepts and the necessary regulatory and legal tools to determine and form the perspective directions of growth of start-up technology firms.

It is vitally necessary to reorient the domestic engineering industry to an intensive, forward-thinking path of development, which requires the solution of a complex of accumulated interrelated and interdependent problems in the legislative, regulatory, financial, economic, educational, personnel and other spheres. At the same time, the time factor becomes crucial, given that the developed countries re-equip their industry every 7-10 years.

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