Assessment of technological development and economic sustainability of domestic industry in modern conditions

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Abstract. The study is devoted to assessing the technical and technological sustainability of industrial production in the Russian Federation. The study proved that the basis of the Russian economy is industrial production, the results of which form the country's gross domestic product, maintains socio-economic stability and provides the population with various consumer goods. At the same time, the analyzed indicators of output, depreciation and renewal of fixed assets and the level of innovative development of production capacities indicate a drop in the technical and technological stability of industrial production. The work proposed a structural-logical scheme for ensuring technological development and economic sustainability of industrial production, containing requirements for the development of indicators for determining sustainability and mechanisms for its achievement in the context of the implementation of different scenarios for the development of industrial production. In conclusion, the study presents the main findings and results of the work.

1. Introduction
The industrial potential of the modern Russian economy began to form in the middle of the last century, when the transition from manufactory to industrial production was completed and the main industrial production facilities were built [1]. This period was marked not only by the construction of enterprises, but also by the creation of completely new types of economic activity and a qualitative transition to new technologies. In the future, industrial production was transformed to the needs of society and the economy, which was marked by the emergence of additional industry institutions that ensure the management and development of industrial production [2; 3]. With the beginning of market relations in the Russian Federation, the principles of management and ownership of industrial enterprises began to change. Such trends have led to the formation of competition, a decrease in the social responsibility of industrial enterprises, and most importantly, the desire for profit and...
superprofits. All this led to the destruction of the built-up system of functioning of industrial production enterprises and the exposure of new problems [4; 5].

Modern society and the state before industrial production set new goals and objectives, which are effective production, maximum satisfaction of consumer needs, reduction of production costs and access to qualitatively new technologies [6]. At the same time, the increased trend of globalization, integration, and the creation of new network structures require industrial production to adapt to new operating conditions in order to maintain positions in the global economic space and ensure highly efficient production [7]. Of course, in order to ensure the transition to a qualitatively new development path, it is necessary to assess the existing potential of industrial production, analyze the level of technical and technological sustainability and the volume of innovation introduced into the industrial complex of the Russian Federation.

2. Materials and methods
The purpose of this study is to assess the technical and technological sustainability of industrial production in the Russian Federation. To achieve this goal, the following tasks:

- to analyze the current state of technical and technological sustainability of the industrial production of the Russian Federation;
- propose a structural-logical scheme for ensuring the technical and technological stability of the industrial production of the Russian Federation.

The study used methods of factor, historical, statistical, logical, comparative, and economic-mathematical and system analysis, a method of expert assessments that allowed the authors to solve the tasks.

3. Results
In the Russian Federation, industrial production occupies a crucial place in the country's economy, this is due to the creation of jobs, the formation of regional budgets and the country's gross domestic product, the development and construction of a new social infrastructure, and the provision of necessary food and food products to the Russian population. At the same time, industrial production ensures the international and economic development of the Russian state, which is associated with the creation of transnational corporations, the supply of Russian products to world markets, the export of fuel and energy resources to national markets, thereby ensuring the growth of the state economy [8; 9; 10].

Of course, the stable functioning and development of industrial production should be ensured taking into account the modern conditions of a qualitative transition. However, any transition must be evaluated from the point of view of introducing innovative technologies into the production process or limiting and eliminating potentially wasteful, physically and morally worn out production facilities. For a more objective analysis and formation of proposals for the development of industrial production, in our opinion, it is necessary to consider the volume of industrial production, the level of capacity utilization, the state of fixed assets and the level of innovative activity. Consider the volume of industrial production in the Russian Federation (figure 1) [11].

It can be seen from the presented figure that there is a tendency towards an increase in the volume of sales of industrial products, while a similar trend is observed not only in monetary terms, but also in the volume of production of natural products.

When analyzing the level of utilization of the average annual production capacity of organizations for the production of certain types of products, it can be concluded that most of the production capacities are not used, for example, in a number of industrial productions only half of the capacity is loaded. Next, we present the state of fixed assets of industrial production in Russia (figure 2) [11].
From the presented figure it is seen that the degree of depreciation of fixed assets decreases every year and reach 47%, while the output of production capacities does not exceed 1% per year, which indicates the absence of a policy for the disposal and liquidation of fixed assets for industrial production. Although the volume of commissioning of production capacities reaches 4% per year, at the same time, they are not being built to compensate for retired capacities, but to build up or develop the production activity of individual enterprises or types of economic activity.

The next indicator, which is worth analyzing, is the innovative activity of industrial production. The analysis of indicators indicates that the proportion of organizations conducting technological innovations is as follows:

- mining operations - 5.1%;
- manufacturing industries - 13.7%;
- electricity supply - 5.1%;
- water supply - 2.7% [11].
Thus, the analysis shows that the level of depreciation of fixed assets is quite large and there is no tendency to decrease it, while updating fixed assets is aimed at expanding production, and not at building new capacities instead of liquidated ones, and a limited number of organizations carry out technological innovations [12; 13; 14]. At the same time, in the Russian Federation there is an increase in the volume of production, both in money and in kind, which aggravates the need to search for new mechanisms for maintaining technological development and economic sustainability of industrial production [15].

4. Discussion
Optimization of production capacities, in order to maintain the most efficient capacities and ensure technological development and economic sustainability, must be carried out according to uniform rules, which can be represented in the form of the following structural and logical diagram (figure 3).

**Figure 3.** The structural and logical diagram of technological development and economic sustainability.

It can be seen from the presented scheme that at the initial stages an analysis of existing methods for assessing technical and technological stability is carried out, indicators and methods for assessing technical and technological stability are developed. At the next stage, an assessment is carried out according to the developed methodology and comparison with established indicators. The following are options for maintaining the balance of production and consumption of goods and services as a result of the elimination of worn-out production facilities.

Thus, the presented structural and logical scheme for achieving technological development and economic sustainability contains the principles for assessing technological and technological sustainability [16; 17]. At the same time, it is possible to achieve technological development and economic sustainability through the gradual elimination of worn-out capacities and the construction of new logistics systems in
order to deliver goods to the territory of liquidated capacities, or by developing mechanisms, methods, approaches and tools for ensuring technological development and economic sustainability due to the commissioning of innovative production facilities.

5. Conclusion
As part of the study, it was substantiated that industrial production forms the basis of the economy of the Russian Federation, which includes the extraction of natural resources, manufacturing, electricity and water treatment. The analyzed indicators reflecting technological development and economic sustainability indicate a decrease in sustainability, which is caused by the growth of morally and physically worn out equipment, the lack of innovative development and the low level of renewal of production capacities with a constant increase in production volume. Based on the results of the study, a structural-logical scheme for ensuring technological development and economic sustainability was proposed.

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