

# Balanced Innovative Development of Energy Enterprises Under the Conditions of Digitalization as a Factor of Economic Security of Russia

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**Abstract**—The article deals with the issues of digitalization of energy enterprises as representatives of one of the most important sectors of the Russian economy, which determines the possibility of developing other spheres of the national economy in order to ensure the economic security of the Russian Federation.

As a priority direction of digitalization, the "digitalization" of innovation activity is justified, which allows to accelerate the pace of our country's innovation breakthrough and create favorable conditions for security in the economic sphere and at the national level. Based on the analysis of the existing experience of digitalization of energy enterprises, it is determined that there are currently a number of problems that prevent the effective implementation of measures in accordance with the developed program of digitalization of energy enterprises and their innovative activities.

The low level of applied management methods, technologies and tools used for digital transformation of innovative activities of representatives of the energy industry is considered to be one of these problems. Organizational and managerial innovations are defined as a tool for bringing the applied management technologies and management methods to the necessary level.

It is proved that the effective digital transformation of energy enterprises is possible only with the simultaneous application of innovations in the technological sphere and non-technological forms of innovation, which will contribute to creating favorable conditions for ongoing changes, complementarity and complementarity of transformation processes in order to obtain a synergistic effect that leads to a stronger positive innovative result. It is proposed to implement digitalization for the purposes of innovative development on the principles of balance, which

digital technologies should find simultaneous application in the technological and managerial sphere.

The implementation of changes in the proposed version will ensure the successful innovative development of energy enterprises on the basis of digitalization, which will contribute to the formation of the necessary conditions for economic security.

**Keywords:** *economic security, digitalization, energy enterprises, management system, balanced innovative development*

## I. INTRODUCTION

In the context of events taking place in the world politics, the problem of ensuring economic security is particularly pressing in our country, which directly determines the national economy's stability and dynamics of development, its efficiency and competitiveness among other competitive of empyrean in the internal and embracing markets

The state of economic security ensures the creation of favorable conditions for the effective functioning of both individual economic entities and the state in tote. In this context, issues related to the search for solutions, which implementation lead to the creation of such conditions, become particularly relevant.

At the same time, there are several drivers of economic security in our country that are actively developed and supported at the state level. The first of them, which has been a priority for more than ten years, is the innovative

development of domestic enterprises, which target parameters are defined in the strategy of innovative development of the Russian Federation for the period up to 2020. The second one which received a significant boost after the 2014 crisis, is the development of priority sectors of the national economy, primarily representatives of the energy sector as the flagship of economic development, which is reflected in Russia's Energy strategy for the period up to 2030. The third, which is becoming more and more relevant – is the transition to digital technologies, or digitalization, of Russian enterprises. Digitalization is declared to be the main course in the coming years by the Decree of the President of Russia No. 204 of 7.05.2018 "on national goals and strategic objectives of the development of the Russian Federation for the period up to 2024".

Aspects of development within these drivers are widely covered in the works of modern researchers. At the same time, as a rule, there is the following division of the issues taken into consideration: digitalization of innovative processes of enterprises [1,2,3,4], digital transformation of energy enterprises [5,6,7,8], innovative development of representatives of the heat and power complex [9,10,11,12,13]. At the same time, the issue of digitalization of innovative processes of energy enterprises is not taken into consideration.

According to the authors, the most promising avenue for ensuring the Russian Federation economic security is to consider the synergy of the main drivers of development, expressed in the digitalization of innovative activities of energy enterprises, which creates favorable conditions for development not only for the energy sector but also for representatives of other industries.

## II. ANALYSIS OF THE MAIN TRENDS IN DIGITALIZATION OF ENERGY COMPANIES

The digital economic emergence means the shift to a new stage of social economic development, including the system of information technologies and their widespread introduction. Digitalization is aimed at performance improvement of the management quality and such fields as information and communication technologies, trading, banking sector, transport, and also offers the challenge to improve quality of people's living [5]. Taking into account the importance of the energy complex for the Russian economy and the effect that the results of digital transformation provide (first of all, reducing costs and improving the efficiency of production processes), focusing on this industry in terms of digitalization is quite justified. Currently, the Digital energy project is being actively implemented in Russia, the main goal of which is the digital transformation of the fuel and energy sector and the introduction of innovative developments. The main projects of digitalization in the energy sector are automation of transmission and distribution of electricity, equipment monitoring, enhancement of safety, improving the quality of energy supply to consumers, the introduction of a risk-oriented approach, the creation of new intelligent ecosystems, the introduction of digital substations and "smart networks". The program of creating a single digital space of the Russian industry as a result of the joint operation of the Ministry of

Industry and Trade of the Russian Federation and Siemens is considered to be a pioneering collaboration in the sphere of energy sector digitalization. The complex implementation of digital technologies in all stages and production levels is planned. This is due to the fact that Russian energy companies are the drivers of promoting economic upturn and social modernization in the country.

However, nowadays the actual results of digitalization do not correspond to the established targets, as evidenced by expert estimates [14]. According to the business digitalization index, Russia is on the same level as Poland and Greece (31 out of 50), in terms of the intensity of digital technology use, Russia ranks 26th out of 32 countries surveyed, and the digitalization of the energy complex is 13 points behind the EU countries.

However, the significant limitation of digitalization's transition is technological inferiority of many spheres, caused by the lack of bankroll, the low level of innovations and underdeveloped financial market. In the ranking of the World Economic Forum, Russia ranks 41st in terms of digital economy readiness and 38th in terms of economic and innovative results in the usage of digital technologies. Currently, the contribution of the digital economy to the country's GDP fluctuates in the range of 1.2-4.5 % [15].

Despite the "loud" statements of the Russian energy Minister Alexey Texler that the Russian heat and power complex is in an absolute trend with global trends, accompanied by the simultaneous launch of numerous projects for the digital transformation of production processes in the industry, as experts point out, digital transformation in Russia stands still, and in order to maintain our country's competitive position in the world market, according to Bloomberg estimates, the transition to digital technologies must be carried out in the period up to 2025. Accordingly, this determines the need to intensify the processes of digitalization, and this opportunity is provided by the transfer of "digital" innovation, which, in turn, is aimed at solving problems that hinder the implementation of digital technologies.

## III. DIGITALIZATION AND INNOVATIVE DEVELOPMENT

Thus, the results obtained indicate that there is currently insufficient elaboration of issues that allow for effective digitalization of not only the current activities of energy enterprises, but also their innovative activities. The most important value of energy enterprises transition to "digital rails" is the creation of conducive conditions for their innovative development. The digital technologies usage helps to optimize the development processes of information exchange and implementation of innovative ideas, search for solutions and interaction of innovative project participants. In addition, the introduction of digitalization, the evidence of practice shows, provides growth of eventual positive outcome of activity, expressed in profit mark-up, cost saving, improving the product and services quality. As a result, the company acquires an additional source of financing for its innovation activities.

#### IV. JUSTIFICATION OF THE NEED FOR BALANCED INNOVATIVE DEVELOPMENT

At the same time, one of the conditions for successful innovative development, not only of energy enterprises, is their readiness to perceive innovations in the technological sphere. The development and implementation of technological innovation ideas should be accompanied by appropriate innovative development of the "host environment", ensuring the creation of conducive conditions for changes carrying-out. First of all, the processes of innovative changes should affect the managerial system, which determines the fundamental possibility of development as part of the innovational potential.

Innovative activities are associated with the managerial processes complexity. The processes of development and implementation of new ideas require the use of new management tools, technologies, and methods in order to ensure the expediency and effectiveness of managerial decisions in the innovative project implementation. Therefore, in order to ensure the effectiveness of innovative activities, the managerial system itself should be innovative, based on the use of modern methods and managerial technologies, which will allow to react swiftly to emerging development requirements.

The aspect of the managerial system development for innovative development is currently considered by researchers and specialists from different points of view. For instance, a set of principles for the innovative activities implementation is proposed, which determines the organization of managerial activities as one of the priorities [1]. The concepts of "open innovations", cloud computing, online platforms are taken into account [16,17]. The proposals in the field of digitalization of the managerial system for the purposes of innovative development are undoubtedly relevant [2,3,18].

Digitalization determines the need for intellectualization and existing management systems. Certainly, digitalization should also cover the managerial system, which is indicated as the most important factor affecting the speed and effectiveness of digitalization of the enterprise as a whole [19,20]. It is no coincidence that one of the most pressing problems of insufficient intensification of the digitalization processes of energy enterprises is called inefficient management technologies.

In the search for solutions to improve the efficiency of innovative activities of energy enterprises, researchers pay attention to the issues of standardization and establishing relationships with contractors but do not address the issues of internal organization of management processes.

Pointing to the problem of energy enterprises innovative development, which consists in non-compliance of the management system with the changes taking place, experts, however, do not offer specific solutions to it. As a rule, conclusions are conceptual in nature.

We propose to consider the problem from the perspective of implementing organizational and managerial innovations, which are new management technologies, methods and

methods aimed at developing and implementing effective management solutions.

Confirmation of the demand for organizational and managerial innovations for energy companies is the results of research on innovative activities (PJSC "Hydro WGC", PJSC "Stock Company G. M. Khrzhizhanovsky Power Engineering Institute", PJSC "IDGC of Centre", PJSC RDC Electric Power, PJSC "WGC4"), reflecting the high demand for them (in 60% of cases) [13]. Moreover, the reasons for this need are the need to implement new strategic goals and the emergence of a complex management problem that requires an innovative approach to solving it. This is exactly what applies to the situation of digitalization of energy enterprises.

Innovative digitalization will not yield the intended effect if there is a gap between the technological sphere and the managerial system, which will determine the slowdown in the processes of transformation, transmission and data processing. The whole enterprise should be in a closed information loop, projecting the necessary information on the innovative processes and functioning in general. Accordingly, in order to avoid such a gap, digitalization must take place in an integrated manner. At the same time, the main condition and principle of effective transition to digital technologies should be a balance that determines the dynamism, synchronicity, complementarity, complementarity of the data collection processes, transmission, processing and transformation between the technological and managerial spheres.

The balance of innovation projects of technical-technological and organizational-administrative sphere should be achieved, defined as the optimal ratio of simultaneously initiated innovative projects in the technical-technological and organizational-administrative sphere, based on the resource, structural, and functional security plan and the results expressed in achieving the targets of development and balance innovation processes and energy companies, expressed in the continuity, synchronization, resource allocation, dynamism, unified orientation of the development processes in the technical, technological, organizational and managerial spheres, and convergence of their outputs to a common development goal. Only in this case a positive result of innovative digitalization will be achieved, supplemented by a synergistic effect due to the transition to a single information complex of all existing systems of the energy enterprise.

#### V. CONCLUSIONS

Thus, the innovative digitalization of energy enterprises, implemented on the principles of balance, will create the necessary conditions for their innovative development, which will contribute to improving economic security both at the level of individual enterprises and at the level of our state as a whole.

Moreover, in our opinion, further research in this direction will allow us to find solutions to other problems that accompany the process of digitalization of enterprises in both energy and other sectors of the national economy, such as generating and accumulating funds for development, reducing the risks associated with changes, and optimizing the processes of developing and implementing innovations.

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