

Investment Activity of the Fuel and Energy Complex of Russia: Organizational and Economic Mechanism



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Abstract: *The main problems of innovative activity in Russia are considered. An analysis of the current state and prospects of further development is carried out. Ways of increasing the efficiency of the fuel and energy complex are considered. Fundamentally new types of energy are shown.*

Keywords: *innovation, fuel and energy complex, scientific and technical development, economics, planning, management, energy, progress, high-temperature superconductivity, electricity.*

I. INTRODUCTION

One of the most important areas of scientific and technological progress is the fuel and energy complex [1-3]. This area has its specific features caused by geological conditions, a variety of climatic and natural factors and high social significance.

Energy, in terms of innovation, is considered a conservative industry. The actual service life of fixed assets can reach tens of years, while modernization directly depends on fairly large investments that have a long payback period [4]. Unfortunately, in the energy sector, unlike other industries, companies are characterized by a fairly low level of R&D [5]. Despite this, innovative development, an important management tool, is needed to ensure effective growth for all key international companies in the energy sector.

At the moment, the following problems of the fuel and energy complex of Russia are the most relevant:

- reduction of exploration works;
- low investment attractiveness;

- depreciation of fixed assets;
- low level of development of technological processes, etc.

To resolve these issues, it is necessary to:

1. pay attention to the use of non-hydrocarbon energy sources;
2. develop innovative ways to extract energy from raw materials;
3. design new equipment and discover new ways to generate it to reduce a large number of accidents caused by a high degree of depreciation of fixed assets;
4. implement innovative projects to increase the investment attractiveness of the industry.

II. PROPOSED METHODOLOGY

A. General description

It is necessary to use innovation and scientific and technical activities as a basis to improve the efficiency of a country's energy complex. Innovative, as well as scientific and technical, policy in the fuel and energy segment is based on modern achievements and forecasts in the key areas of applied and fundamental world and domestic science, as well as the fuel sector. More attention should be paid to the development of basic research in order to create and implement highly efficient new technologies in the fuel sector of the Russian economy.

In the forecast period, the priority directions of the state innovation, scientific and technical policy are:

- resource-saving;
- product quality improvement;
- technical equipment update;
- modernization of experimental information base;
- improvement of all stages of the investment process;
- development of international cooperation in the field of domestic modern developments;
- protection of intellectual property rights to the results of scientific activity;
- development of scientific potential and human resources, etc.

The following activities are required to implement these priority areas:

- support of promising areas at the state level;
- state control and accounting of R&D;

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- organization of optimal financing of fundamental science in the oil and gas industry;
- development and implementation of new technologies of extraction, transformation, production, transportation and use of resources;
- development of renewable energy technologies

B. Algorithm

An important stage of scientific research is the search and development of renewable energy sources: wind energy, hydropower, tidal energy, bioenergy, sunlight energy, etc. Also, it is necessary to maintain and develop one of the traditional sources of energy in Russia – civilian nuclear power.

Developments related to high-temperature superconductivity are of particular importance for the qualitative improvement of energy, because this will solve the problems of energy storage and will allow building not just power lines, but superconducting ones. The appearance of superconducting storage units will make it possible to ensure the maneuverability of nuclear power plants [6].

The main mechanisms for state regulation of the scientific innovation sphere of the fuel and energy complex include: formation of economic conditions for sources of financing, creation of targeted innovation and scientific and technical programs, creation of a system of effective control of innovation activity, creation of new consolidated sources of sectoral financing, effective protection of intellectual property, etc. [7].

It is well known that economic processes are cyclical. In this cycle, it is at the stage of stagnation that innovative ideas lead to the development of capital. The decline in economic activity shows the possibility of a successful resolution of economic difficulties through innovation. The following areas of innovation activity progression can be distinguished in the sectors of the fuel and energy complex: changes in the composition of the world fuel markets, inefficiency of the raw material scheme of the national economy, technological backwardness of the industry, increased energy intensity of the gross domestic product, etc.

The main feature of the innovation activity for the fuel and energy complex are process innovations. The following are accepted as objects in innovative activity in the energy sector: non-current assets, technological processes, marketing, economic entity management system.

The overall investment attractiveness is reduced by certain features of the fuel and energy complex, namely the long capacity commissioning period, which increases the payback period of capital investments. Most of the innovative projects focused on income generation in the short term are not implemented in the activities of organizations. In addition, innovative projects in the organizations of the fuel and energy complex are characterized by significant capital intensity.

Features of innovative activity in the fuel and energy complex include state monopoly on some types of activity, limited participation of regional authorities in innovation processes and low activity of medium and small businesses in innovation.

Innovation in the fuel and energy complex of Russia is characterized by the greater presence of modifying innovations over radical ones. This fact can be explained by

the technical and economic specifics of products, works and services in the industry. Radical innovations are a modern and efficient way of replacing or generating hydrocarbon energy sources, which is relevant for the Russian fuel and energy complex [8].

In many countries, radical innovation is a priority in the energy sector of the economy, namely the search for clean and alternative energy sources.

Their interest in this area is caused by two significant factors:

1. Increasing energy prices and decreasing resource base of traditional energy sources;
2. Significant deterioration of the environmental situation on the planet has intensified a large number of environmental organizations.

The prospects for energy change also reflect the indicators of its spread in the world. Thus, since 1970, only the characteristics of wind power generation have increased worldwide from almost zero to 3.9% [9].

Alternative energy sources have taken a strong position among modern energy sources. Tax incentives used in different states concerning private investment in current innovative projects of this sector, such as a tax credit for investments to insurance companies, are a key tool for improving the innovation activity of the fuel and energy complex of the United States. In general, in the USA, financial resources come from private companies and from the state to the continuous development of innovations in the energy complex.

Only the reorientation of the innovation management structure in the industries and companies of the fuel and energy complex on the innovative path of development will improve the Russian energy sector. The process of reorientation is associated with an increase in the intellectual level of management processes, without which it is impossible to solve new problems, such as:

- creating and implementing the habit of looking to the future when choosing a scientific and technical policy in the industry and in the company of the fuel and energy complex, which should meet the requirements and needs of the economy;
- the innovation sector needs regular forecasting and analytical work;
- analysis procedures and a wide range of analytical methods need to be implemented to clearly understand future priorities;
- complex improvement of management quality in industries and companies of fuel and energy complex;
- introduction of new technologies, solutions, programs and projects necessary to achieve the goals set by the policy of innovative development.

III. RESULT ANALYSIS

A. Tasks

The solution of the above tasks will provide an opportunity for the development of innovation policy and will lead to the introduction of a system of technologies from technological,

technical, legal and organizational measures and solutions for their introduction and implementation and compliance with the requirements of innovation policy and economic policy for the selected perspective.

To solve the most important tasks in the field of innovative development of the fuel and energy complex, it is necessary to plan and forecast the main activities in this industry.

Planning is the process of creating targeted regulatory solutions that contribute to one of the selected development scenarios, including through a system of projects, programs and business plans.

Forecasting helps planning and greatly improves planned developments as a continuous reference point. Analytical work and forecasting are an integral part of innovation and the information base for the creation, preparation of scientific justification of decisions and development of several options for the scientific development of the company (for example, the scheme of arrangement and development of the oil industry in the long term, a comprehensive plan for the technical development of the fuel and energy complex for 15 years).

Moreover, there are private technical and scientific forecasts for the main areas of the industry, for example, construction, exploration, development and so on, as well as private plans for certain regions, associations, etc.

Unfortunately, there is no such forecasting system now. However, it should be noted that a rational universal system can be created between companies for integrated planning of scientific and technological progress at oil enterprises in a market economy.

The features of such a system include, first of all, the general coherence of the unified strategy of scientific and technical development of oil organizations, the common legal and economic space at the level of the entire oil industry, including the subsoil, the problems of taxation and subsurface replenishment, investments in innovations and the transition to an updated model of their management. In addition, this commonality will facilitate the communication of innovation policies between companies, the overall strategy of their sector of industry and the fuel industry as a whole based on a full and timely exchange of information, which contributes to the formation of a coherent mechanism of communication between companies.

The effective development of the oil industry is impossible without a dramatic increase in oil production from the bowels (at this stage more than half of the resource remains in the strata). The use of nanotechnology and fiber-optic systems and, thus, the creation of intelligent deposits are fundamentally new scientific branches. It is obvious that the future of the oil industry is based on the use of advanced science, as well as latest technologies and methods in the system of advanced production processes.

B. Prospects

The Strategy for the Development of Science and Innovation in the Russian Federation for the Period until 2035 states that the main sources of investment in the innovative development of the fuel and energy complex will be extra-budgetary [10].

However, an attractive investment climate is necessary for investor interest in the development of innovative

technologies, namely investor protection from risks, state guarantees and subsidies.

One positive example is the experience of some countries of the European Union, which are constantly developing various programs and strategies, as well as conduct major conferences and summits on the development of renewable energy sources. These events are a platform to discuss the work done on the development of the industry, the results of activities, the preparation of new plans, as well as the adjustment of existing ones. One of the main objectives of these events is to inform the population about the importance and benefits of renewable energy development.

It would also be very effective for oil and gas companies to constantly increase the share of renewable energy sources and develop new technologies in this area.

In addition, it is necessary to organize a special independent commission to monitor the tasks assigned to the company, which could apply fiscal measures and penalties.

Threats to the development of renewable energy sources in Russia, for example, include subsidies to oil and gas companies at the federal level. As the international experience of economically developed countries shows, new and unprotected sectors of the economy should be subsidized. With regard to the development of renewable energy sources, subsidies would have a positive effect, namely in the area of innovative technologies. Technological backwardness as a rule negatively affects the development of any state and its energy independence. In addition, one of the significant problems is the sanctions against Russia. The sanctions have restricted access of the Russian oil and gas industry to import modern technologies, including renewable energy technologies.

The main problem of the development of renewable energy sources in Russia is the lack of interest of officials, lack of control, monitoring the forecasts and plans, as well as the lack of punishment for failure to perform assigned tasks.

As practice shows, in the presence of formal decrees, developed strategies and provisions, the objectives of which are much lower than in economically developed countries, are not implemented.

Thus, one of the main directions of the formation of world energy is the development of new technologies for the mining, production and transportation of energy resources, as well as the use of unconventional forms of energy, which will lead to increased competition in the markets of energy resources.

The development and spread of breakthrough technologies in the world can not only increase competition but also significantly change the structure of international energy flows, which will create new opportunities for the Russian fuel and energy complex [11].

Innovative management has been widely used in recent years in the practice of world entrepreneurship in the field of management of technical and scientific activities and to achieve the intended goals. The methodological basis in this area of management is a key systematic approach to finding solutions to management problems, methods of program goals and strategies for managing important projects.

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Investment management studies and forms the basic laws of the company and regulation of innovation, conducts planned and analytical studies, forms the innovation policy of the organization, develops a regulatory and methodological framework for innovation and evaluates the effectiveness of research, innovation and technology.

Today, the sphere of innovative management in the Russian oil industry is one of the weak points in the overall concept of management of enterprises and the industry as a whole. The main disadvantages are as follows:

- universal underestimation of the importance of the problem of innovation management at all levels of the fuel and energy sector;
- insufficient development of innovative, long-term planning mechanisms at the enterprise level;
- inadequacy of analytical research and forecasting, lack of demand for them leads to the need for reforms in technology policy at the company level and at the level of the industry as a whole;
- depth of solutions developed in the innovation sphere leads to the economic impossibility of their implementation;
- no regulatory and methodological support for innovations in the industry.

The following is necessary to implement the science and technology policy and its priorities in the fuel and energy sector: to strengthen state financial support; to develop a system of principles of economic support for the introduction of new technologies, to create a regulatory framework for innovation.

It is necessary to maintain human resources to ensure the above areas. For this purpose, it is necessary to provide:

- growth of attractiveness and prestige of scientific and technical sphere;
- creation of good conditions for active attraction and long-term consolidation of talented young personnel in the field of technology and science;
- improvement of the relationship between the level of education of scientists in accordance with the necessary needs for the implementation of these technologies in the fuel and energy complex, the most important innovative projects on the scale of national importance;
- improvement of the quality of education and training of highly qualified scientific personnel.

The key task in the sphere of international scientific and technical cooperation should be the formation of favorable conditions and methods for its development. For this purpose, the following is necessary:

1. state support and motivation for international cooperation for the implementation of major innovative projects;
2. development of relations with the member states of the Commonwealth of Independent States.

The implementation of the directions of innovation, scientific and technical policy in the fuel and energy complex should be carried out following the established programs for the development of these industries.

IV. CONCLUSION

Thus, the entire course of the development of the Russian national economy is impossible without new approaches to

innovation and requires expansion and better-estimated validity of decisions. In addition, it is necessary to move from individual developments at the level of companies, but also activities to implement the strategy of technical development of the organization, the industry and the fuel and energy complex as a whole. It is necessary to acquire new knowledge and exchange experiences with the leading powers. The key area of activity on this issue is the effective formation of innovation policy.

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