



FEATURES OF FINANCING INNOVATIVE ACTIVITIES OF OIL AND GAS COMPANIES

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Abstract

Currently, research and development (R&D) is underfunded in the oil and gas industry, which leads to a significant technological lag of domestic companies in the global economy. Therefore, there is a need to form an effective mechanism for financing their innovative activities. In this regard, the consideration and comparison of methods and tools for financial support of innovative activities of foreign and domestic oil and gas companies seems to be very relevant. The subject of the study is the organizational and economic relations of oil and gas companies that arise in the process of forming an effective mechanism for financing their innovative activities.

Keywords: Financial resources, Smart Field, innovative strategies, innovation management, suppliers, consumers, competitors, corporation, innovation policy, financial leasing

INTRODUCTION

Currently, there is insufficient R&D funding in the activities of oil and gas companies, which leads to a noticeable technological lag of domestic companies from foreign colleagues. In the current conditions of globalization, in order to achieve high and high-quality economic growth in Uzbekistan, as well as to increase its competitiveness and efficient use of resources, there is a need to form a mechanism for financing innovative activities in all sectors of the national economy, including the oil and gas complex (OGC), which occupies a special place in the economy of Uzbekistan. The oil and gas complex has a significant impact on all sectors of the domestic economy, as it is one of the main sources of its growth. However, despite the fact that

the oil and gas complex plays a key role in providing the state with financial resources, there are a number of negative trends that have a significant impact on its development.

In modern market conditions for oil and gas companies, one of the main competitive advantages is the effectiveness of innovative activities. As a rule, the introduction of innovations is associated with a high level of risk. In order to determine the feasibility of a particular innovation in the organization in the long term, the authors propose to consider the value chain of the product or the company as a whole.

Focusing on the value chain of the product, rather than its value, the analysis is carried out taking into account future cash flows, that is, the future reaction of the consumer, which is very relevant for innovation. An important element affecting the value generated by the product in long-term planning in the oil and gas industry is research and development (R&D). Accordingly, the principles of organizing a company's R&D management system should be aimed at improving the efficiency of innovation and minimizing risks. The use of process and result monitoring when applying the project management approach is proposed as the most rational approach (Savinova, 2013).

RESEARCH METHODOLOGY

The methods of comparison and analysis of statistical indicators, graphical interpretation of data were used, which allowed to identify the dynamics and features of financing innovative activities of oil and gas companies in the global economy. Based on the use of the systematic approach method, proposals have been developed to optimize the financing of innovative activities of oil and gas companies.

RESULTS

Currently, there is insufficient R&D funding in the activities of oil and gas companies, which leads to a noticeable technological lag of domestic companies from foreign colleagues. In modern conditions of globalization, in order to achieve high and high-quality economic growth, as well as increase its competitiveness and efficient use of resources, there is a need to form a mechanism for financing innovative activities in all sectors of the national economy, including the oil and gas complex, which occupies a special place in the economy. (Savina, 2013). OGC has a significant impact on all sectors of the domestic economy, as it is one of the main sources of its growth. However, despite the fact that the oil and gas complex plays a key role in providing the state with financial resources, there are a number of negative trends that have a significant impact on its development.

Table 1 R&D expenses of oil and gas companies of
foreign countries in 2013-2018, billion USD

Companies	Country	2014	2015	2016	2017	2018
ROSNEFT	Russia	0,86	0,59	0,48	0,51	0,51
GAZPROM	Russia	0,28	0,16	0,19	0,18	0,18
LUKOIL	Russia	0,15	0,09	0,12	0,13	0,16
SHELL	Great Britain	1,22	1,09	1,01	0,92	0,98
EXXON MOBIL	USA	0,97	1,01	1,06	1,07	1,11
CHEVRON	USA	0,71	0,6	0,48	0,43	0,45
BP	Great Britain	0,66	0,42	0,41	0,39	0,43
PETROBRAS	Brazil	1,1	0,63	0,99	0,16	0,17
STATOIL	Norway	0,47	0,34	0,27	0,25	0,32
PETROCHINA	China	2,33	1,89	2,79	3,53	2,82
TOTAL	France	1,79	1,5	1,62	1,58	1,64

Source: compiled by the author according to the annual reports of companies

The Chinese company Petrochina is the undisputed leader in terms of absolute volumes of expenses for innovations, from 2014 to 2018. She invested an average of about \$ 2 billion annually. Brazil (Petrobras), the United States (Exxon Mobil), the United Kingdom (Shell) and France (Total) on average invested \$ 1 billion annually, which is half the investment of their competitor from China.

It should be borne in mind that the absolute values of the costs of research and development are not quite correctly used to compare the volume of financing of innovative activities of oil market players, since the scale and results of their activities are not always comparable.

Venture capital is a long-term and high-risk equity investment in newly created companies that are high-tech and promising in their industry. In world practice, venture capital funds of leading oil and gas companies (Shell Technology Ventures, Statoil Technology Invest, BP Ventures, etc.) show high efficiency of activity. Maintaining business relations with various research centers and companies, innovative organizations, providing resources for internal and external stages implementation of the innovation process, the possibility of investing in startups - all this gives venture financing. It increases the profitability of R&D-related projects, strengthens capitalization, reduces the technological gap from competitors, and also helps expand the activities of oil and gas companies around the world.

To optimize the financing of activities related to R&D of oil and gas companies, the following activities may be carried out based on foreign experience:

1. Development of models of open innovation, increasing R&D by attracting investment partners with a long-term perspective will increase the effectiveness of financial support for innovative activities of companies. To implement this measure, OGC companies need to increase demand for third-party developments and increase co-financing of projects.
2. The use of government measures to stimulate innovative activity of companies in the oil and gas complex of the Republic of Uzbekistan will help create a competitive environment in the oil and gas complex, create conditions for the development of natural minerals in the most efficient way, and also attract external venture and direct investors. To implement this measure, it is necessary to introduce tax incentives to organizations engaged in innovative activities in the oil and gas industry and to revise indirect financing methods. (Gretchenko, 2018).
3. Corporate venture capital fund as the basis for the creation and development of financing innovative projects will provide an opportunity to reduce the technological gap from competitors and ensure the effectiveness of R&D. For the effective operation of such a fund, at the stage of its creation, it is necessary to determine the main parameters (number of projects, volume, planned profitability, implementation stages) and potential sources of the project. (Eder, 2014).

By comparing and analyzing the specifics of financing innovative activities of NGK companies abroad, it can be concluded that the main problem facing the domestic oil and gas complex is the need to introduce high-tech production and innovative technologies. The use of measures that optimize investment in activities related to R&D is one of the items in the development strategies of many oil and gas companies. The use of corporate funds for venture financing allows OGC to increase its own competitiveness in the global market.

In modern conditions of the oil and gas market, characterized by deterioration of fixed assets, a decrease in the rate of hydrocarbon production and saving financial resources for maintenance, technical diagnosis and repair of oil and gas facilities, the following main technologies are most in demand:

1. Technology for assessing the technical condition of operating wells for various purposes, without killing them;
2. The technology of integrated research in wells for the intensification of oil and gas inflow and the allocation of working intervals of formations, including in complicated geological conditions. This allows you to get accurate and reliable information about the quality of saturation of the intervals of the reservoir, the position of the gas-oil contacts in various conditions, which increases the efficiency of planning work on overhaul of wells and intensification of the flow of hydrocarbons and quality control.

It is worth noting the possibility of using and implementing other innovative projects. Today, the Smart Field concept ("smart field") is actively developing - a whole range of intelligent technologies that allows not only to automate production, but also to manage it in real time.

Smart Field begins with the automation of technological and production processes (MES level). One of the key components of the concept is the Foxboro NetOil & Gas system, which allows you to measure well flow rates directly at the wellhead and determine the flow rates of water, oil and gas. This measurement system does not require additional heating of oil, which reduces energy costs.

Smart Field also allows you to control various types of pumps (deep, submersible, screw) and provides remote access to all field equipment based on wired and wireless sensors, allowing you to diagnose its condition and, if necessary, configure it.

In addition, the concept includes solutions for smart power supply and control of the oil and gas treatment system, including booster pump stations and flare systems, controls reservoir pressure maintenance systems, including water intake stations, water metering stations, injection wells, and also controls oil pumping stations and tank farms.

Smart Field makes it possible to make predictions about the state of the formation, simulate various events and situations, virtually experience new scenarios, saving time and money while increasing operational safety.

Intelligent technologies reduce energy costs and personnel (reducing its required number), increase well productivity and extend their life cycle.

FoxboroEvo distributed control system, a platform for building a full-scale process control system, can greatly simplify life for oil and gas enterprises.

FoxboroEvo allows you to create a kind of "factory of the future." This architecture assumes a modular approach based on the use of distributed, replaceable, loosely coupled components (services), which, however, have standard interfaces and interact using standardized protocols.

The system provides information on performance indicators, provides cost accounting by responsibility centers and cost-effective management of safety and efficiency of fixed assets online. FoxboroEvo can be easily upgraded, which solves the problem of fast obsolescence of ICS.

Similarly, the PlantStruxure PES architecture is being actively used in the oil and gas industry to optimize production processes and energy consumption. PlantStruxure PES covers all three levels of automation: field devices and controllers, SCADA systems and MES systems. This architecture is an intermediate solution between traditional automated control systems on programmable logic controllers and complex distributed control systems.

PlantStruxure PES is based on software that allows you to configure individual types of equipment and the entire automation system from a single shell. The architecture includes libraries of the most commonly used elements and solutions, as well as energy management functions.

Based on the PlantStruxure architecture, a new generation automation system has been developed for both main and intermediate oil pumping stations and tank farms.

An InFusion automation system has been created for oil refineries and petrochemical enterprises, which allows you to plan enterprise resources and manage supply chains and energy resources. InFusion provides automation of various refineries, including the most complex technological equipment, optimizes energy consumption, maintenance, storage and supply. The system solves such problems as operator training, modeling, process analysis and optimization in real time. (Astafiev, 2013).

One of the important tasks facing the economy of Uzbekistan at this stage is to create the necessary conditions for organizing an effective innovation process in the leading sectors of the country's economy.

Deepening market relations, developing in the conditions of fierce competitiveness of enterprises and industries for creating their niche in both the external and domestic markets, pose new problems and challenges for business entities, the main of which is the right choice of a strategy that helps strengthen its market position and to obtain those market advantages that would ensure sustainable operation. An empirical analysis of the trends and factors of economic growth in a number of countries indicates that it is innovations that determine the level of development of the country's economy, and is its driving force.

With large reserves of oil and gas, as well as other minerals, Uzbekistan is committed to their rational and integrated use. That is why the identification of the role of expanded reproduction of material (all means of production created by man), labor (people of working age) and natural resources (potentially suitable for use in the production of natural raw materials) in improving the structure of production potential is one of the most important scientific and practical tasks.

Based on the study, we identified the possibility of various innovative strategies for managing the development of enterprises of the oil and gas complex of the republic.

The development of the principles for the formation of innovative strategies is based on the classification of innovations according to various criteria: the primary cause of the appearance of innovations and their types, the form and scale of the novelty of the innovation strategy, industry affiliation and orientation on the effectiveness of innovations, the proposed set

is a system in which each principle is an element that ensures This system has new properties in the process of forming an innovative strategy. (Silkin, 2014).

One of the determining innovative factors in improving the management of industrial enterprises should be considered the transition of the dominant state policy to an active policy of supporting production structures of production.

Important aspects of innovation management in the context of large monopolies in the oil and gas industry are the choice:

- type of innovation strategy according to the results of the study;
- general economic policy;
- the formation of adequate organizational structures for its implementation;
- analysis of the main functions of innovation management.

Innovative activities in the field of industrial potential management at NHC "Uzbekneftegaz" are based on: the search for new technologies and necessary resources, as well as their assessment; search, creation and management of production; cash income and competitive advantage.

Innovative activity allows you to resolve the contradictions associated with the fact that every thing (phenomenon, attitude, process, system) contains objective development trends. Their implementation is carried out thanks to the targeted innovative activity of socio-economic entities. Innovation activity itself is internally contradictory, since a certain discrepancy between goals and results in innovation is inevitable, which is associated with the consideration of the objective and subjective in the innovations themselves. (Aghion, 2005).

Innovative activity at the enterprise is explained by two hypotheses - technological and market demand pressure. According to the first, the technological impetus is the basis of this process, and the second is the pressure of market demand.

A functioning market mechanism and emerging demand contributes to the development and differentiation of basic technologies through a series of improving innovations. The long process of accumulation of knowledge, patents, inventions, "know-how" preceding radical innovations is explained by the lack of conditions for their implementation, which includes not only the possibilities of technological, technical, informational, organizational, managerial and economic development, but also institutional and social factors. (Bakhtizina, 2012).

It is easier to convince by a quantitative improvement of individual process parameters than by innovations (fundamentally new scientific ideas that revolutionize production forces; based on the change of generations of technology, the appearance of new technology while maintaining the original fundamental scientific principle; modifying ones associated with the quantitative improvement of individual parameters of this generation.

The effectiveness of innovation is determined by the degree of effectiveness of innovations compared with the costs of the industry entrepreneur for their implementation and implementation. Innovations usually bring a delayed effect, which is not revealed immediately upon their completion, so the way to determine their effectiveness by costs is not always acceptable.

Often, the beneficial economic effect of radical innovation cannot be achieved without the use of evolutionary innovations, including among consumers, which implies a change in the consumption process itself, related to the improvement of the qualifications of managers, managers, specialists and other personnel, ensuring the loading of expensive equipment, etc. In this case, the effect of the new technological system is not expressed in a decrease in the unit price, but in a reduction in the unit of the total cost of applying radical innovations value in relation to the sum of their beneficial properties. Therefore, the purpose of innovation is to determine the main areas of scientific, technical and industrial activity of the enterprise.

The development and implementation of new products is the main goal of innovation. The development and production of new types of products is becoming a priority in the strategy of the oil and gas industry, as it determines all other areas of its development. The implementation of innovative management (management) is associated with the creation of temporary target groups for a comprehensive solution of innovative problems - from ideas to mass production. What are necessary for: qualified personnel; development of plans and programs for innovation; monitoring the development of new products and their implementation; consideration of projects for creating new products; pursuing a single innovation policy; providing finance and material resources to the innovation program. The creation of such a system (science - production - transportation - sales) is objective and logical, since scientific and technological progress (especially ICT, automation, communications, microprocessors, etc.) and the needs of a market economy contribute to this.

Significant scientific groundwork has been accumulated in the study of the laws of scientific and technical progress, methods of their use in various industrial and economic practices, the system of laws of development of science and technology, etc., for employees of Uzbekneftegaz NHC, especially specialists from institutes of UzLITneftegaz, IGIRNGM, AOOT "Oil and gas construction."

OJSC "UzLITneftegas" carries out pilot industrial works on the introduction of modern technologies for intensifying hydrocarbon production in long-developed fields with difficult to extract reserves; performs design and survey work and scientific and technical support of production tasks for field development, transportation, oil and gas processing, etc.

In the oil and gas industry, it is planned to carry out measures for the reconstruction and technological re-equipment of oil and gas refineries in order to more fully and efficiently use hydrocarbon raw materials, reduce energy costs in technological processes, and bring the quality of products to international standards.

In order to increase production efficiency, more than 100 scientific and technical developments of the institutes of the republic, which are included in plans for the introduction of new technology, are annually introduced at the enterprises of the industry.

The above-mentioned and other innovative measures to improve the management of the oil and gas complex are the main factors for increasing the efficiency of the NHC components.

The progressive innovative potential of the oil and gas industry — production, organizational, technological, technical processes — is constantly being improved. At the same time, industry personnel themselves are changing, creating and applying more and more sophisticated and effective equipment or technology, a form or methodology for organizing production, research, development, production, oil and gas refining, qualitative changes are taking place in its management methods, in personnel relations with nature.

It is important to identify the internal (goals, objectives, structure, personnel, technology of the enterprise) and external (suppliers, consumers, competitors, laws and government bodies, the state of the economy, social culture, scientific and technological progress, international events, etc.) factors of all these multifaceted and contradictory processes, a system of interrelated laws that govern them.

The findings of a survey of 120 American corporations showed that more than 60% of all development work does not turn into new products. The results of a survey of 50 American companies showed, the author writes, that 50% of their R&D expenses were spent on innovations that turned out to be unsuccessful, and 30% of the innovations that were recognized on the market soon ceased to be profitable. According to American economists, the probability of success of innovations that have appeared on the market does not exceed 74%. Therefore, innovations requiring high costs are only possible for large companies, provided with financial resources and resources. (Pogodaeva, 2013).

Unlike small enterprises, such large monopolies as Uzbekneftegaz National Holding Company (NHC) have the material and financial ability to master basic, strategic innovations. Using the economies of scale and having large capital, this company is able to master strategic technologies that are of priority importance for achieving progressive shifts in managing the country's industrial potential. For example, using high technology in oil refining, the country has moved from an extensive to an intensive development path

Among the causes and braking factors of technical innovations include:

- deficiencies in the financial and credit sector, the deficit of the state budget, which together cause significant reductions in investment proposals;
- imperfection of the organizational structure of innovative activity; imperfect mechanism of functioning of scientific and innovative organizations; lag in the implementation of effective public policy, etc.

The study showed that the possibility of forming an effective system of innovative measures to strengthen the management of the industrial potential of the oil and gas industry depends on factors such as:

- the current level of development of production;
- The state of the mechanism of the innovative potential of the holding;
- the level of development of the innovative potential of the facility;
- type and orientation of the organizational structure of management.

It should be noted that these factors are not arranged in decreasing order of importance, since it is obvious that some of them are almost equivalent in solving specific problems. In addition, factors such as, for example, awareness of the need for change, ongoing development and readiness for them, are decisive in many practical situations.

The main factors of industry competitiveness and its ability to innovate are: solvent demand for industry products; resource intensity and the organization of production associated with it (the quality of raw materials in other material resources, as well as the quality of the technologies used); the level of depreciation of fixed assets of enterprises in the industry and the level of investment in technical and technological re-equipment.

The depreciation level of fixed assets and the level of investment in technical and technological re-equipment is characterized by the data in table 2. Theoretically, all investments in fixed assets can be attributed to innovative.

Table 2 The dynamics of the level of depreciation of production fixed assets and the level of investment in the technical and technological re-equipment of oil and gas enterprises

	Unit	2014 y.	2015 y.	2016 y.	2017 y.	2018 y.
1. The level of depreciation of production fixed assets	%	41,6	44,1	45,6	47,2	46,4
2. The level of investment in reconstruction, technical and technological re-equipment	% to investments in fixed assets	48,8	33,1	32,4	34,8	33,6

However, in our case, we excluded from the volume of investments those that were aimed at the construction of new enterprises, i.e. took into account investments for technical re-equipment, reconstruction, expansion and maintenance of existing enterprises, individual objects of existing enterprises.

Thus, based on the data presented, it is possible to give a positive assessment of the ability of the oil and gas industry to innovate.

Table 3 Indicators of innovative activity of oil and gas industry enterprises

	Total
1. The number of measures used scientific and technological progress	352
2. Total economic effect (billion soums)	152,7
From it profit growth (billion soums)	141,9
Including due to cost reduction	15,3
3. Saving fuel and energy resources and material and technical resources	
Gasoline (tons)	806,7
Electricity (thousand kW/h)	7456,9
4. Additional production volume	
Natural gas (million m3)	10594,4
Gas condensate (thousand tons)	425,1
Petroleum (thousand tons)	103,9

The table analyzes the indicators of innovative activity of oil and gas industry enterprises (table.3). However, an analysis of the innovative activity of enterprises in the industry showed that there are a number of problems that hinder the innovative development of enterprises. The main directions of improving innovative management in the work proposed:

- expansion of state innovation policy;
- Creation of a venture capital fund with state participation;
- introduction of financial leasing;
- transition to innovative structures;
- The combination of innovative and investment capital.

The implementation of these areas is based on a high level of innovative management, the methodological foundations of which are not sufficiently developed with regard to corporate systems. Thus, the study and scientific analysis of literary, scientific, practical and theoretical materials and factors affecting the components of the production potential of the oil and gas industry have shown the effective use of innovation management mechanisms (development

and implementation of new types of products, sales and methods of oil and gas transportation) at the enterprises of the industry have a significant impact:

- the creation of a system of "science - production - transportation - sales" taking into account modern information and communication technology and the Internet;
- development of a marketing program for a new product in the oil and gas industry;
- training of creatively capable specialists, managers and executives for the oil and gas industry of Uzbekistan.

CONCLUSION

Having studied the world practice of financial support of innovation, you can notice a number of patterns inherent in all subjects of the world economy in recent decades:

Firstly, the role of innovation as a factor in economic growth and increasing the country's competitiveness is gradually increasing, which causes the interest of states and corporate structures in increasing investment in R&D.

Secondly, as the economy develops, the share of non-state sources in the financing of innovative activities grows, and the state's share remains mainly financial support for basic research and the creation of innovative infrastructure. The government bodies of countries that have embarked on an innovative path of development are moving from direct financing of innovation to indirect methods of regulation, to the application of measures to stimulate and enhance the development of innovative private business.

Thirdly, another trend is the emergence in the innovation sphere of professional investors, special funds, experts on the selection of innovative projects, connecting links between institutional, informal investors and innovation developers, scientists and engineers.

In addition, the growth of activity in the innovation sphere of developing countries: China, South Korea, India, Israel, etc., can be observed throughout the global economy.

Thus, the financing of innovative activities on a global scale has the goal of not only increasing the competitiveness of national economies or individual companies, but also ensuring sustainable economic growth through the commercialization of science and raising the economy to a qualitatively new, innovative stage of development.

Thus, we can conclude that the development of new technologies is of great importance for the competitiveness of oil and gas companies. It is innovations and the ability to introduce them that become the most important condition for the long-term competitiveness of international oil companies. It should also be noted that both in the foreign and domestic markets, there is a tendency to search for alternative energy sources. Leading global companies pay special attention to this area of development, constantly investing in the search

and development of such studies. These factors allow you to strengthen your position in the global oil and gas industry.

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