The importance of the feasibility study of investments in the development of the Russian oil and gas industry

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Abstract. The article considers the issues of determining the cost of construction of oil and gas facilities at the pre-project stage. The great importance of investing in the construction of oil and gas facilities for the industry and the country's economy as a whole is analyzed. Shortcomings were identified when calculating the cost of construction at the pre-project stage. Ways of improving the accuracy of the calculations the cost of construction of industrial facilities in the development of feasibility study of investments, including a proposed supplement to its existing base of estimated regulatory documents in large-size collectors of the rates of industrial construction. Also, as part of the method of determining the estimated cost based on enlarged collections and a data bank of previously constructed and designed objects, it is proposed to make adjustments to the register of cost-effective project documentation for reuse. The authors are convinced that increasing the accuracy of calculating the cost of construction products will improve the efficiency of investment in industrial construction.

1. Introduction

Today, the Russian oil and gas industry is the largest structure that exerts its influence not only within the country, but also abroad, and also occupies a key position in the economy of the RF.

Today, oil is a powerful argument in conducting foreign policy affairs. Russia has great potential on the world market of fuel and energy resources. According to estimates, about 13% of the world's oil reserves and 34% of natural gas reserves are concentrated on the territory of Russia, which shows the country's definitely strong position in this area [1].

Having large reserves of hydrocarbon raw materials and supplying them to world markets, the RF has a significant influence on the formation of the international energy security system [2].

The feasibility study is a key document that reflects the effectiveness of project financing, and is a reference when deciding on the implementation of investment projects in construction. Capital construction plays a key role in the implementation of scientific and technical achievements, thereby creating and updating the production base. The oil and gas industry is the main beneficiary on the Russian market. According to the federal state statistics service, investments in fixed assets in the RF by type of economic activity: production of crude oil and natural gas have the following dynamics: in 2014- 1 494,9 billion rubles, in 2015- 1 582,7 billion rubles, in 2016- 1 597,1 billion rubles, in 2017- 1 807,1 billion rubles, in 2018- 1 851,7 billion rubles [3].

The above factors justify the relevance of the chosen topic, as the development of the industry requires the establishment of efficient production and improvement of the previous activity of the
enterprise, and given that the construction of such plants consumes high investment needs proper planning not only investment, but also obtained income.

2. Problem Statement

Despite the drop in oil and gas prices in recent years, and the general problems of the Russian economy, the country’s oil and gas companies continue to invest billions of dollars in new projects for the development and production of oil and gas resources. In this regard, the efficiency of individual regions and territories depends directly on the performance of individual enterprises that are part of the production potential of the region. The gas industry is one of the fastest growing in the fuel and energy sector.

The main condition for expanding economic reproduction in Russia is the efficiency of investment in real sectors of the economy. An increase in the volume of capital construction, as a rule, leads to an increase in demand for the purchase of construction materials, which increases the investment attractiveness of projects for the development of production at domestic enterprises of the construction industry.

The oil and gas industry consistently ranks first in the number of capital construction projects. The share of these objects in the total volume of conclusions prepared by the main state expertise of the RF at the end of 2017 was about 85%. The construction process in the oil and gas industry is characterized by a long implementation time, capital and material intensity. The products are individual in nature, as they are intended for a separate customer [4]. The average life of an oil and gas project is 25-35 years, which is due to the geological, technological and design features of the industry. In this regard, a well-founded, thorough evaluation of the project is of high importance.

In this regard, we can identify a number of problems and issues that need to be addressed immediately. The analysis of trends and identifying the dominant structural elements in the field of construction investment in the oil and gas industry are essential for further development of not only the industry but also the economy as a whole.

3. Research Questions

The greatest importance in considering issues related to the development of a feasibility study for investment in industrial facilities is the inability to determine the cost of construction at the pre-project stage using enlarged collections. Based on the data obtained in the course of the study, it is possible to form measures aimed at supplementing the existing budget and regulatory framework.

4. Purpose of the Study

The purpose of the scientific article is to determine the significance of the accuracy of the development of a feasibility study of investments in oil and gas facilities for the development of this industry, as well as to identify trends and directions that contribute to the development of this area, based on investment and innovative approaches. The results obtained will provide recommendations for improving the accuracy of calculating the cost of construction at the pre-project stage when developing a feasibility study for investments.

5. Research Methods

This study should present different points of view that give the concept and structure of the feasibility study of investment in construction.

Today, the main task of construction activities of oil and gas companies is to develop the most effective investment and construction projects. Each implemented investment project must be effective under any conditions of its implementation [5].

At all stages from development to implementation, a feasibility study of the decisions made is carried out, which differs in the methods of carrying out, due to the required degree of accuracy, resulting from the tasks facing the justification.
The main regulatory document regulating investment activities in the RF is Federal Law № 39-FL “On investment activities in the RF carried out in the form of capital investments”.

In accordance with article 1 of this law, an investment project is understood as “Justification of the economic feasibility, volume and timing of capital investments, including the necessary project documentation developed in accordance with the legislation of the RF, as well as a description of practical actions for the implementation of investments (business plan)” [6].

Before implementing an investment and construction project, it is necessary to make sure (without forgetting the risks and uncertainties) that the benefits (usually expressed in monetary terms) resulting from the successful completion of this project and the achievement of its goals should exceed the costs of its implementation. The document confirming the usefulness of the investment and construction project is a feasibility study.

Thus, the feasibility study (feasibility study) is the main document that is being developed for investment projects in order to determine their effectiveness and feasibility of implementation [7].

The feasibility study of the project is one of the main project documents for the construction of facilities. On the basis of the feasibility study, approved in the prescribed manner, preparing tender documents and bidding of the contract for construction of the facility, a draft of the construction documentation, the agreement (contract) for the construction, offer financing.

When the feasibility study of investment and construction projects identifies the main technological, constructive and space-planning decisions; evaluates operational, sanitary-epidemiological and ecological safety of the project; determined the economic efficiency of the project and its social effect for companies [7].

It is impractical for oil and gas companies to implement a project if it is technically feasible but economically inefficient. Although, often, when evaluating the effectiveness of some projects, the efficiency obtained after the completion of the project (with a posteriori evaluation of efficiency) and the planned efficiency calculated at the pre-project stage may not coincide [8].

In practice, there is no universal approach to the feasibility study and its universal model covering industrial projects of any type, size or category. We use a wide range of recommendations for most investment projects.

In the “Guidelines for evaluating the effectiveness of investment projects and their selection for financing” approved by the ministry of economy of the RF on 21.06.1999, the approach to evaluating the effectiveness of investment projects is adapted to the market conditions of the economy. The main principles of evaluation are: multi-criteria evaluation, accounting for the impact of inflationary processes, bringing different-time costs and revenues to the conditions of their commensurability in terms of economic value to the initial period.

The feasibility study usually provides a project financing scheme, investment plan, and sales plan; describes production, organizational, and financial plans; and calculates coefficients that reflect the financial condition of the enterprise, as well as indicators that characterize the economic efficiency of the project [8].

The effectiveness of an investment project is a category that reflects the compliance of the project that generates this investment project with the goals and interests of its participants [9].

Setting requirements for the feasibility study helps to improve the quality of investment decisions, allows you to maximize the effectiveness of investments, and establish a system of evaluation criteria for preliminary investment decisions [7].

As of 01.01.2019, the production of oil and gas condensate (oil raw materials) on the territory of the RF was carried out by 290 organizations that have licenses for the right to use the subsoil, and 251 enterprises that produce natural and associated petroleum gas.

The main volume of national oil production (85.2% of the national figure) is still formed by the largest vertically integrated companies. At the same time, the share of independent oil companies is increasing, whose total contribution to the total oil production in the country reached 14.8% in 2018.

Based on the data from the website of the ministry of energy of the RF in picture 1 we consider the dynamics of oil and gas condensate production and natural and associated petroleum gas.
According to the results of 2018, the volume of national production of crude oil increased by 9.1 million tons compared to 2017 and amounted to 555.9 million tons in absolute terms. Of the resulting increase, more than half—5 million tons—was obtained from new fields with a service life of up to 5 years.

In 2018, total gas production (natural and associated oil) in the RF increased by 5% and amounted to 34.3 billion m$^3$ by 2017, reaching a new record level for the entire period of Russian gas production—725.4 billion m$^3$.

In the structure of Russian gas production, the obvious trend in recent years is the decline in the share of Gazprom. If in 2009 the group's share in gas production in Russia was 80%, in 2018 it was 68%.

In 2017, the industry accounted for 9.3% of the country's GDP, 52.8% of exports, and 38.4% of revenues in the federal budget. In 2017, Russia exported 253 million tons of oil worth $ 93 billion.

The main part used in Russia natural gas consumed from the heat - and electricity - 37%, about 11% of the population, 9%- company FEC, 8% - household sector, a 6% metallurgy, 29%- other consumers. Most of Russia's natural gas is consumed for heat production (29% in 2015), followed by the electricity sector (24%).

In comparison with other gas-producing countries, Russia is in a unique position, since it simultaneously meets the needs of a huge domestic market, as well as supplies volumes of gas that are unique for world practice for export.

The RF is firmly ranked second in the world in terms of oil exports. The leading Saudi Arabia's oil exports in 2017 were estimated at 360-370 million tons, while the “catching up” Iraq and Canada—at170-180 million tons.

Gas exports from Russia increased by 14 billion m$^3$ in 2018 to 213 billion m$^3$, including deliveries of pipeline gas abroad increased by 4.1%, and LNG by 70%.

Let's look at Figure 1 and 2 for the dynamics of hydrocarbon exports from Russia from 2012 to 2017. [10].
MEASURES TO INCREASE THE CALCULATION OF CONSTRUCTION COSTS
OIL AND GAS FACILITIES AT THE PRE-PROJECT STAGE

Oil and gas companies are committed to developing new areas of activity, in particular oil and gas chemistry, power generation, and renewable energy. The stable growth of the share of renewable energy sources is an attractive fact for investing in this segment, which allows oil and gas companies to participate in the development of new approaches to energy production [11].

Each construction object is implemented on an individual project and is tied to a specific territory, so the means of labor and labor force are constantly moving from one object to another. The nature of the objects being constructed and the work being performed is very diverse, the cost of which is determined by a specific indicator-the estimated cost. The final result of construction is construction products that represent the main production assets put into operation [5].

If the investment project involves the construction of an object, then all stages of construction and installation work should be displayed in the investment plan of the feasibility study, designed to systematize information about the costs of the investment stage. The construction stages of an object
can be performed either sequentially or in parallel. A GANT chart is usually used to visualize the project's network graph. The diagram shows the time dependencies of the construction stages and the relationships between them, which helps to plan the construction stages [8].

Also, when describing the project, it is necessary to plan possible costs for reengineering and redevelopment, maintenance costs and property management. Another additional condition for making an effective decision may be several variations of the same project. It is obvious that in this way, it is possible to optimize the decision-making process for the project implementation [9].

For a more in-depth and detailed analysis of the investment plan of the feasibility study, participants can study the project documentation of the object under construction in accordance with the decree of the government of the RF of 16.02.2008 № 87 “On the composition of sections of project documentation requirements for their design” [8].

However, the availability of all this information with sufficient accuracy is possible only when the project documentation (PD), including the construction organization project (COP) and the feasibility study are developed. This means that the design is already underway, and the collection of project information and design is estimated at 3-5% of CAPEX [9].

In the practice of oil and gas companies, for accounting purposes, real investments are divided into two groups- CAPEX and REVEX.

CAPEX represents capital investments in fixed assets, while REVEX represents non-capital expenditures for the current period that are included in the cost price. CAPEX investments can be represented as investments in the construction of wells, in the construction of production and transport infrastructure, and in the purchase of equipment.

Examples of REVEX include all exploration costs, except for the construction of wells, the cost of drilling exploration and evaluation wells that did not produce an industrial flow of oil, the cost of performing certain geological and technical activities, the cost of non-capitalized research work, the cost of maintaining roads, the cost of managing the implementation of a business project or investment program at an early stage.

Oil and gas companies consider investment areas by type of activity: exploration, production, processing, transport, sales and logistics. When analyzing the structure of real investments of oil and gas companies, it can be found that more than half of the funds are spent on exploration and production, and the main part of them is spent on the development of fields.

Thus, we understand that the investor needs a valuation method that would allow him to provide all the necessary data with sufficient accuracy even before the start of the design. In this regard, the following problems may occur at the pre-project stage:

It is quite difficult to determine the cost of construction of CAPEX facilities at the pre-project stage, when the project documentation, including the estimate documentation, has not been developed. In the method of determining the estimated cost of construction products in Russia is one of the methods of determining cost: based on aggregated estimate standards, including the bank data on the cost of previously built or designed analogues [12]. Currently, the budget and regulatory framework of the RF has developed a group of enlarged collections of construction price standards (CPS), which are recommended to be used to determine the estimated cost at the pre-project stage [13]. The calculation of the cost of aggregated indicators is usually used at the preliminary stages of design or at the stage of investment planning, when information about design solutions is not available in full, or to simplify the estimated calculations. The calculation of the cost of aggregated indicators is based on the premise that the necessary costs to obtain a unit of useful final effect in the same state of general economic conditions and the ratio of supply and demand in a particular market should be equal. That is, the unit costs per unit of useful effect (output, installed capacity, area, volume, etc.) on the market are determined not by the individual costs of each individual contractor, but by the average level of costs that occur at a given time [14].

Industrial objects are not included in the enlarged collections of the CPS. Then, for the purposes of preliminary calculation of the estimated cost of construction in the oil industry, you can only use a data bank on the cost of previously built or designed analogs. The website of the ministry of construction of
the RF presents a register of cost-effective project documentation for reuse [15]. The above-mentioned register does not include industrial objects. Given all of the above, the developers of the feasibility study face a difficult task-to determine the preliminary cost of construction of objects, without having sufficient information for this in the existing budget and regulatory framework.

6. Findings
Taking into account the results obtained in the course of the study, it is possible to form the main measures for improving the calculation of the cost of construction at the pre-project stage as part of the feasibility study. To do this, you must:
1. Develop collections of consolidated construction price standards for production facilities at the Federal level.
2. To expand the range of existing collections of the CPS is to include an additional representative projects.
3. Include in the register of cost-effective project documentation for reuse not only residential and civil objects, but also industrial objects.

7. Conclusion
Investment is one of the foundations of social and economic development at the macroeconomic level. The feasibility study is a key document that reflects the effectiveness of project financing, and is a reference when deciding on the implementation of investment projects in construction. Our proposed ways to improve the accuracy of construction cost calculations at the pre-project stage will allow us to determine the customer's investment costs in the framework of developing a feasibility study of investments. This in turn optimizes the volume of investment in the construction of oil and gas facilities.

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