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**DEVELOPMENT OF PROGRAM MEASURES FOR IMPORT  
SUBSTITUTION IN GAS PRODUCTION**

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*Abstract*

In today's difficult conditions, new approaches are being formed to ensure the modernization of the domestic economy and increase its competitiveness in the global hydrocarbon market. The challenges facing the country's economy are becoming more complex. The introduction of sanctions against Russia and response measures have stimulated the development of new ideas and methods of transition to domestic technologies and equipment.

Implementation of import substitution policy is an actual research. The result of this policy should be to increase the competitiveness of domestic products by stimulating technological modernization of production, improving its efficiency and the development of new competitive products with relatively high added value. In turn, the level of industrial development of the country increases, which leads to an increase in its economic security and independence. The article proposes a program event on import substitution as domestic equipment for liquefied natural gas for gas producing enterprises. There is economic justification for the introduction of a domestic plant for liquefied natural gas compared with foreign technology.

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**Keywords:** Program, modernization, import substitution, efficiency, production, liquefied gas.



## **1. Introduction**

Import substitution is a type of an economic strategy and industrial policy of the state and economic entities, which is aimed at protecting domestic producers by replacing imported industrial goods and technologies with products of national production (About national security strategy of the Russian Federation till 2020, 2014).

Unfortunately, the country has now lost ground in areas where it has historically had a strong competitive position in the world market. Introduced in 2014, the economic sanctions of the United States and the European Union have led to remarkable technological backwardness of Russia that could have serious repercussions on the implementation of numerous projects of the Russian gas industry. In this regard, the Russian branch of the company was forced to look for new business partners not participating in these sanctions (The development of industry and improvement of its competitiveness, 2015).

## **2. Problem Statement**

The object of the study is a public joint stock company NOVATEK, which is one of the largest producers of natural gas in Russia (Statistics of JSC NOVATEK, 2017, 2018). The company is engaged in exploration, production, processing and sale of natural gas and liquid hydrocarbons, has twenty years of experience in the Russian oil and gas industry.

The objectives of the study are:

- The analysis of efficiency of use of program measures for import substitution in gas production.
- Assessment of the impact of various factors on the development of import substitution in the oil and gas sector of the Russian economy.
- Development of the organizational and economic mechanism of import substitution in relation to the gas producing enterprise.

## **3. Research Questions**

The purpose of the study is to develop measures for import substitution in gas production.

## **4. Purpose of the Study**

The theoretical significance of the study is associated with the formation of the organizational and economic mechanism for import substitution in the oil and gas sector of the Russian economy. The practical basis of the scientific research is the possibility of using its results by domestic gas companies in the framework of import substitution policy.

## **5. Research Methods**

Activity of the company is connected with carrying out works on hard-to-recover and unconventional reserves of the hydrocarbons which are on shelf deposits. Public JSC NOVATEK pays great attention to import substitution and localization of production of the main processing equipment in the territory of Russia, and also its modernization (Statistics of JSC NOVATEK, 2017, 2018. The Ministry

of energy, 2017). However, domestic producers are not fully able to replace foreign equipment and technology. Dependence on imports for the items presented in table 01 is especially sensitive.

Policy measures for import substitution are becoming relevant as soon as the strategy of supporting the domestic producer begins to be implemented. Carrying out this strategy is possible at two stages of functioning of the enterprise: at a stage of production and at a stage of realization of finished goods. At the production stage, the import-substituting elements can be raw materials, materials, components, equipment and services of third parties (table 02) (The development of industry and improvement of its competitiveness, 2015).

**Table 01.** The share of Russian equipment in the gas industry

Item name	Share of Russian equipment, %
Processing	38
Natural gas liquefaction	20-25
Pump and compressor equipment	20

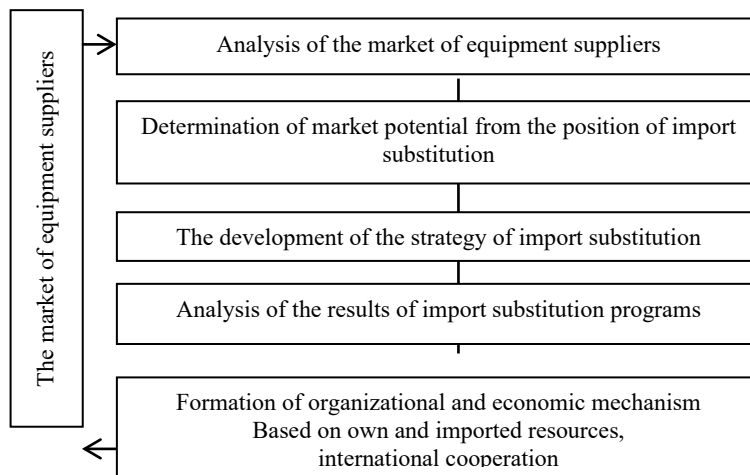
\*compiled by the author

**Table 02.** Suppliers of technological equipment of PJSC NOVATEK] (Statistics of JSC NOVATEK, 2017, 2018).

Equipment	Suppliers
Pipelines technological	JSC Kurganmash, JSC Gazapparat, Halliburton, Schlumberger
Pipeline valve	Scherzer, JSC Penza plant of oil and gas equipment, Schlumberger, GE
Capacitive equipment	JSC Kurgankhimmash, FluxysLNG, Penza oil & gas equipment factory
Heat transfer equipment	JSC Borkhimmash, JSC Gazapparat
Heating equipment	JSC Penzhimmash
Tubular products	FluxysLNG, Linde AG, JSC Gazapparat, Total, ENI
Crane equipment	FluxysLNG, Baker Hughes
Metalworks	Scherzer, JSC Vyborg shipyard, Federal state unitary enterprise Atomflot, JSC United shipbuilding Corporation

\*compiled by the author

To successfully implement the import-substituting strategy, the company needs to develop a sequence of this process (Figure 01).



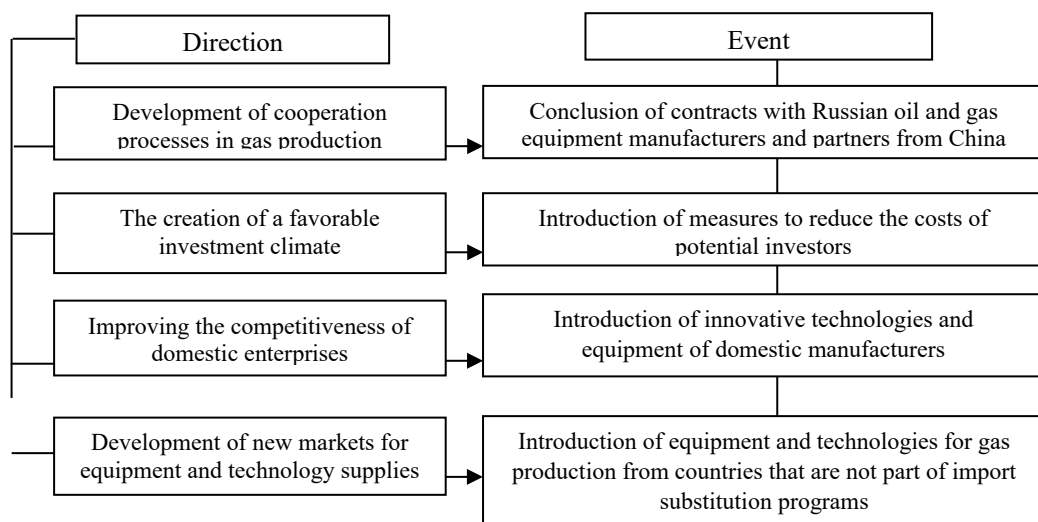
\*compiled by the author

**Figure 01.** The sequence of implementation of programs of import substitution in gas production

Among the priority directions of import substitution in the gas sector, first of all, one should highlight the technology of drilling and operation of wells, technologies of liquefaction of natural gas, geological exploration, transportation of gas and hydrocarbons technology development of tight oil reserves, equipment for the development of the continental shelf (About the national security strategy of the Russian Federation till 2020, 2014).

One of the options for the accelerated development of production is the development of model guidelines for the development of production. In the various public institutions, measures for the support and development of the national production of equipment for gas production and the oil and gas industry in General are developing (Center of import substitution and localization, 2017; Federal state statistics service, Russia, 2017).

Today, the issue of import substitution is one of the priorities in the development of the Russian economy. There are several directions of import substitution in the gas industry of the country (Figure 02).



\*compiled by the author

**Figure 02.** Main directions and measures for import substitution in gas production

An important problem for the domestic gas industry is the high cost of equipment and its long payback period (The development of industry and improvement of its competitiveness, 2015; The Ministry of Industry and Trade, 2017). This gives an advantage to foreign competitors. In order to change the ratio of Western firms to Russian enterprises, it is necessary to put into practice long-term contracts that take into account the prospects of development of customers and suppliers. To do this, there are to the interest rate subsidies on loans, attracted for modernization and implementation of investment projects.

The company is able to replace foreign producers in the gas production, which are presented in table 03.

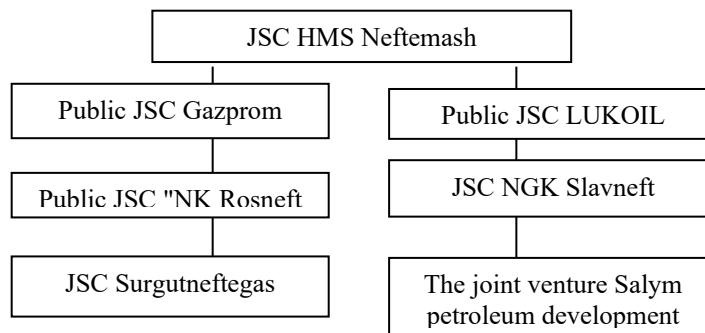
**Table 03.** The companies, able to replace foreign producers in the gas production

Type of work	Previous performers	Profile companies of the Russian Federation, able to replace importers
Service works in exploration, drilling	Shlumberger, Halliburton, Baker Hughes, Weatherford	RN-Drilling, Rosgeologiya, Geotec, Bashneftegeofizika
Field development	National Oilwell Varco, Weatherford, Aker	Uralmash NGO holding, Volgograd plant of drilling equipment
Underwater and mining complexes	FMC Technologies, General Electric, Cameron	JSC OMZ, Vyborg shipyard
Specialized vessels for work offshore	SevNor Limited	United shipbuilding corporation
Engineering software	Schlumberger, Halliburton, CarboCeramics	JSC Surgutneftegas, Limited Elna

\*compiled by the author

The next step may be the legislative consolidation of the advantages of Russian companies over foreign competitors. Similar practices have been developed in countries such as Norway, Canada and China. Only 30% of the total amount of work is given to foreign firms in these countries for contracting. At the same time, disclosure of technologies used in the work is a prerequisite. In Russia, foreign firms providing these services gain access to the strategic sector, but do not disclose the subtleties of their technologies. Based on this, we can conclude that by outsourcing to foreign companies, the state threatens national security (About national security strategy of the Russian Federation till 2020, 2014).

The priority areas of import substitution in the gas industry should include drilling and operation of directional, horizontal and multi-well technologies, technologies of liquefied natural gas, exploration, transportation of gas. In order to reduce the cost of shipping equipment, the company should find a supplier near its own production. Public JSC NOVATEK, the main production of which is located in the Yamalo-Nenets Autonomous district, should pay attention to the partnership with JSC HMS Neftemash in order to implement import substitution programs. This enterprise is one of the largest versatile holdings, which unites the leading machine-building enterprises, engineering and construction companies in the structure in the territory of Russia, Ukraine, Belarus. The main customers of JSC HMS Neftemash products are represented in Figure 03.



\*compiled by the author

**Figure 03.** The main customers of the products JSC HMS Neftemash

The plant is provided with modern equipment and software of well-known domestic and foreign manufacturers. The range of equipment produced by the plant is about 100 species. At the request of the customer, the equipment considering all features of its application in the place of its operation is developed and made. In addition to the manufacture of the equipment, the plant provides training to customer's personnel, warranty and post-warranty service of products (Forecast of energy development in the world and Russia until 2040, 2014).

The geography of supplies has long gone beyond the borders of Western Siberia and the equipment is widely used in existing fields of all gas producing regions of Russia and CIS countries. Among the products-equipment for measuring, there is the production flow rate of oil and gas wells, pumping stations, auxiliary equipment and more (Statistics of JSC NOVATEK, 2017, 2018, Information-analytic review, 2015, 2017).

The company NOVATEK was one of the first in Russia that decided to create the LNG plant in the Yamal-Nenets Autonomous district and was able to attract strategic foreign investors for its implementation. However, due to financial difficulties and sanctions, the company was forced to slow down the development of the project. In addition to financial difficulties for the plant on the basis of Salmanovskoye (Morning) field, the company faced a lack of opportunity to use foreign equipment and the latest developments of foreign partners, in particular, the French technology for liquefied gas (Information-analytical review, 2014. The Ministry of Industry and Trade, 2017.). Gas production enterprises are highly dependent on foreign technologies and equipment.

On the basis of the revealed problems, it is possible to draw a conclusion: political changes negatively affected activity of the enterprises of gas branch. That is why it is necessary to develop a program for replacing foreign equipment with Russian analogues, which are not inferior as foreign competitors.

## 6. Findings

One of the directions of the effective import substitution process is the construction of a plant for liquefied natural gas using equipment supplied from the plant "Neftemash" – one of the largest manufacturers of oil and gas equipment in Russia (Statistics of JSC HMS Neftemash, 2017, Vazhenina, 2011, 2017).

Measures for using domestic equipment should include: construction of a large-capacity plant for liquefied natural gas; purchase of gas equipment at the company HMS Neftemash; purchase of cryogenic tanks for the transportation of liquefied natural gas to other regions of the country and abroad.

Equipment for liquefied natural gas at the Salmanovskoye field should be designed for 260 billion cubic meters of recoverable reserves. About 12 million cubic meters of gas are produced annually at this field, which ensures its operation until 2030. The volume of LNG production is planned to be almost fully sold to other regions of the country and abroad (Statistics of JSC NOVATEK, 2017, 2018. The oil and gas industry of Russia, 2017). Calculation of the economic efficiency of investment in installation on liquefied natural gas (LNG) production and refueling project is presented in table 04.

**Table 04.** Calculation of economic efficiency in the project of production and filling with LNG

Indicators	Value
The design capacity of the LNG plant, million tons/year	10-12
The annual sales volume of LNG, million cub metres	11/15620
The proceeds from the sale of LNG (11*106*1000*22 rub/kg), million rub	242000
Capital investments, million rub	45788.9
Operating costs total million rub, including:	41806.6
- purchase of gas	26879
- materials	8192
- gas for own needs	600.2
- electricity	115
- wage fund with insurance payments	3120
- overhead	650
- depreciation	1560
- maintenance and repair of equipment	624
- other costs	156
Gross profit, billion rub	200.2
Profit tax, billion rub	40.1
Net profit, billion rub	159.1
Cash flow cash flow (PVt), billion rub	161.4
Net present value (NPVt), billion rub	143.7
Accumulated discounted income (NPV), billion rub	1106.2
Internal rate of return (IRR), %	2515
Payback period of capital investments (PEB), years	0.3
Simple rate of return (SRR), rub/rub	3.5
Profitability of production (R), %	437

\*calculated by the author

Based on the calculations, the use of the equipment of the HMS Neftemash plant at the Salmanovskoye field is economically advantageous for the public JSC NOVATEK.

## 7. Conclusion

As a result of the study, it can be noted that the implementation of import substitution programs in gas production with the use of innovative technologies and developments of domestic producers has become possible and made it possible to achieve increased competitiveness of Russian products. Currently, the commissioning of investment projects for liquefied natural gas is one of the promising trends in Russian gas production.

In the course of the analysis of the effectiveness of gas companies' implementation of import substitution strategies (The development of industry and improvement of its competitiveness, 2015), potential domestic producers were identified as capable of satisfying the needs created in the domestic market of oil and gas engineering on a qualitative basis.

The assessment of the impact of various factors on the development of import substitution in the oil and gas sector of the country's economy showed that at the state level it is necessary to make timely adjustments to the legislative and regulatory framework for the development of industry and support domestic production, through representatives on the boards of Directors to conduct their interests in oil and gas companies, to ensure transparency in the procurement of natural monopolies, to inform suppliers about the promising programs of commodity companies, to establish the priority of domestic producers in the supply of oil and gas equipment, etc.

In work approbation of the offered organizational and economic mechanism on import substitution as set of the purposes, tasks, the principles, tools and methods of its realization in relation to the gas producing company were carried out. The introduction of domestic production in comparison with foreign technology of liquefied natural gas is economically justified.

Thus, the proposed event will affect the efficiency of import substitution programs, make the products of JSC NOVATEK competitive and in demand in the domestic and foreign markets of the gas industry.

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