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Strategic Determinants of the Sustainable Development of the Russian Oil and Gas Complex

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Abstract: The article examines the issues of ensuring the sustainable development of the oil and gas complex from the perspective of assessing the hindering and contributing factors of the external and internal environment. The importance of regular monitoring and updating of these factors in modern conditions, their complex non-trivial consideration and interpretation is determined. In general, the purpose of the paper is to critically comprehend and systematize these factors, as well as to develop proposals for correcting the traditional theoretical and methodological basis for developing strategic decisions. The main methods used are methods for determining the strategic balance, SWOT and PEST analysis. The empirical base of the research was formed on the basis of expert surveys, accumulation of data from open sources and relevant regulations at the federal and sectoral levels. As a result of the conducted research, a significant pool of external and internal determinants of development has been formed, recommendations for the development of strategic planning tools have been developed, and the choice of a key direction for the strategic development of the complex has been justified. The results of the research may be of interest in making appropriate decisions regarding the sustainable development of individual industries and industrial complexes. The principles mentioned in the article can also be used at the corporate level of strategizing.

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1 INTRODUCTION

It is difficult to overestimate the importance of the Russian oil and gas complex in the domestic economy. Despite many years of comprehensive discussions and the justified need to change the strategic vector of development of the national economy from raw materials to innovation, the share of oil and gas revenues in the budget of the Russian Federation remains very significant. Moreover, over the past two years, there has been a serious increase in this indicator. According to official data, it was 28% in 2020, 35.8% in 2021 and 41.7% in 2022 (17, 22). At the same time, the high uncertainty regarding the prospects for the development of the oil and gas complex should be noted. This is due to the presence of a large number of external externalities that exacerbate the internal problems of the complex, as well as the high probability of sudden occurrence of "black swans" in the external environment (pandemic, explosions on the Nord Streams, etc.), negatively affecting the basic energy and raw materials industries. Most experts, when describing the prospects for the development of the domestic oil and gas complex, are limited to the time horizon until 2040 (18, 20, 21, 28).Opinions of various scientists and practitioners regarding the future of the complex differ, sometimes diametrically opposed opinions are expressed. Meanwhile, due to the high degree of inertia of the complex's response to external challenges and the importance of the complex for the national economy, the problem of preventive sectoral strategizing becomes very relevant and requires adjustments to existing methodological approaches for making balanced complex decisions (13).

In connection with all of the above, the author has set a goal - to critically comprehend and systematize the factors of the external and internal environment of the Russian oil and gas complex and, based on this understanding, to form recommendations for the development of a theoretical and methodological basis for strategic decision-making.

2 METHODOLOGY

The modern range of tools that allow to conduct a strategic analysis of the environment and make long-term decisions is quite wide. It is mainly represented by general approaches that can be used in the original versions or be transformed taking into account the specifics, scale, internal structure of the research object and other significant parameters. It should be noted that there are explanations according to which classical strategizing tools are difficult to apply in modern conditions. However, expressing the author's point of view, we have to disagree with such opinions, appealing to the fact that the methods require updating and development, respectively, changing the situations in which they are used (11, 15, 16).

Moreover, at present, the opportunities of convergence of individual strategizing tools are becoming more and more apparent. In particular, the long-established PEST analysis correlates quite well with the key aspects of the concept of sustainable development (economy, ecology, society), enriching this concept by including the vector of technological development. At the same time, one cannot but agree that technological aspects today play a significant role in ensuring the sustainability of the development of domestic enterprises, industries and complexes. In addition, the results of the preliminary PEST analysis can be structured as the basis for conducting a SWOT analysis for the purpose of developing strategic decisions in the context of key components of sustainability. In addition, it may be recommended to separate the results of PEST analysis by environmental levels (macro, meso and micro-external) for subsequent implementation of a common (basic) and competitive strategic choice (Fig. 1).

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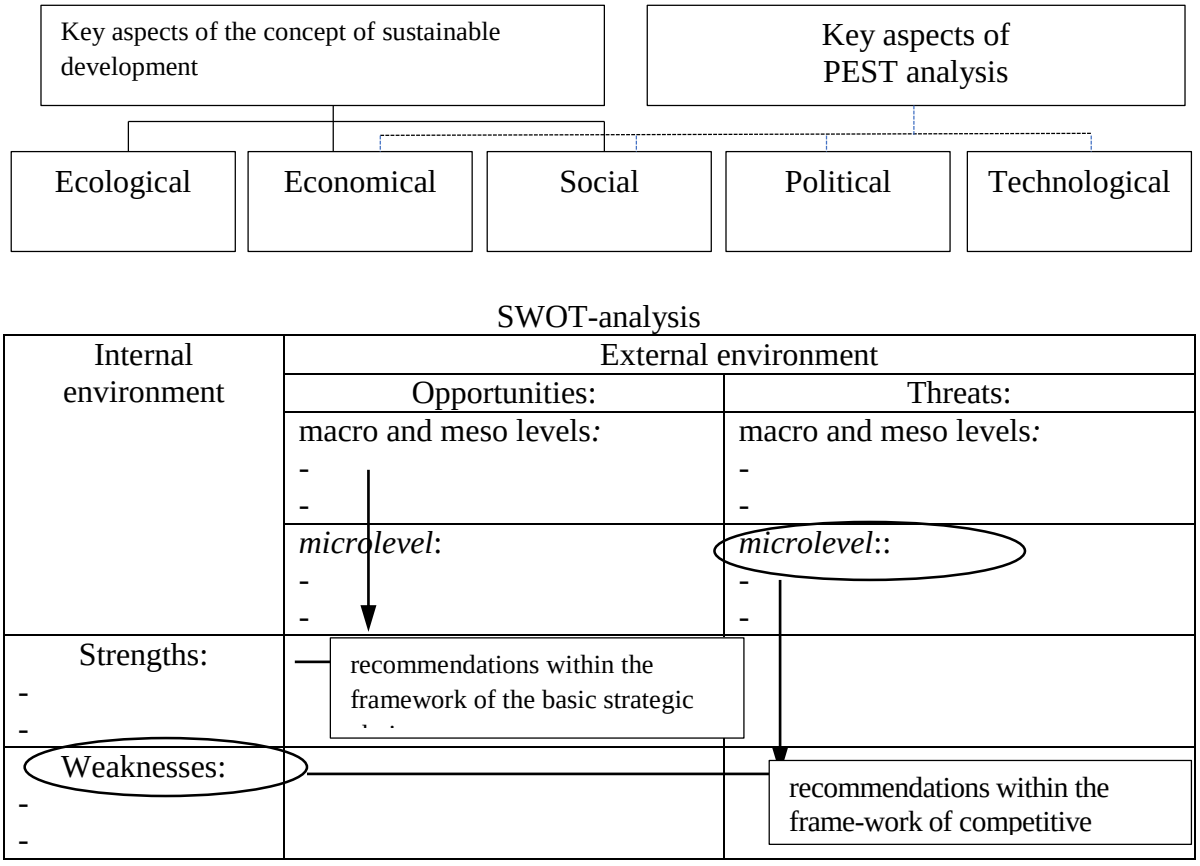

Figure 1: An example of the integrative use of strategic analysis tools.

It should also be noted that conducting strategic research is most often descriptive in nature, their results are difficult to formalize, but, however, they allow to form a basis for justifying and choosing a vector of strategic development, including for the domestic oil and gas complex. One of the most well-known and universal tools of strategic analysis is the SWOT matrix, the description of the essence of which the author considers redundant due to its popularity. However, it is necessary to highlight important policy recommendations and features of using this tool:

- according to the author's observations, experts often use established empiricism when constructing the matrix, respectively, draw conclusions and recommendations, guided by the current situation or past experience. At the same time, strategizing involves developing solutions aimed at the future. In this regard, the special value of the tool is achieved when used in the preparation of a matrix of forecast data. In this research, an attempt is made to implement expert assessments and the existing state of the studied complex, as well as forecasts of its development;

- due to the complexity (ambiguity) of identifying internal environmental factors for strengths and weaknesses, and external environmental factors for threats and opportunities, the author proposes to consider the nature of the factor's influence on achieving the strategic goals of the research object and compliance with its mission as the main criteria for this distribution;

- it should also be borne in mind that the individual components of the matrix have a dual meaning, that is, they can simultaneously act, for example, as an opportunity and a threat. In this case, analysts should give an expansive characterization of the factors, indicating in what specific way its positive or negative influence (character) manifests itself;

- in order to form strategic decisions based on the proposed matrix, a preliminary selection of opportunities and threats of the external environment is recommended, which in the traditional approach is recommended to be done by compiling appropriate

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matrices (probability of manifestation - influence on the goals and potential of the object under study), supplemented by a mutual comparison of factors of the external and internal environment. A possible way to formalize the estimates obtained during the expert assessments may look like this (Table 1):

Table 1: Matrix for assessing the mutual influence of external and internal environmental factors *.

	mutual influence										Total
	Opportunities					Threats					
Strengths	O1	O2	O3	O4	O5	T1	T2	T3	T4	T5	
S1											
S2											
S3											
Weaknesses											
W1											
W2											
W3											
Total											

*Note: +2 – strong positive influence; +1 – average positive impact;

0 – no influence; -1 – average negative influence; +2 – strong negative influence.

- the author also suggests supplementing the implementation procedure of the SWOT analysis with the stage "threats→ search for opportunities", in which threats to the external environment should be considered from a different angle, involving the search for opportunities in threats.

Moreover, in modern conditions, according to the author's position, it is advisable to implement foresight strategizing (8, 19). That is, to transform the nature of strategic behavior from adaptive (adapting) to formative. This may require a fundamental revision of the methodology of strategic analysis in general, and SWOT analysis in particular. So, in the classical interpretation of this tool, the technology of its implementation assumes initially to analyze the environment (external and internal), and subsequently to develop strategic recommendations involving leveling the impact of threats and using the opportunities of the external environment. When implementing foresight strategizing, the sequence of strategy development may be different:

Stage 1. Mission statement ("image of the future state" of the object under study).

Stage 2. Mission specification through SMART goal setting.

Stage 3. Identification of strategic gaps (deviations of the existing state of the object from the target).

Stage 4. Development of recommendations for achieving the target state.

Stage 5. Designing the necessary conditions for the implementation of recommendations.

In this case, strategic activities will presumably be aimed at creating external conditions to achieve synchronization of the existing state of internal factors with their target values.

3 RESULTS

In the course of studying expert opinions obtained from open sources, as well as using information from program documents of the federal, sectoral and regional levels (24,25, 26, 27, 28, 29, 30, 31, 32), the author has formed the following lists of the main elements of the matrix of the strategic balance of the domestic oil and gas complex:

Strengths

S1 - significant contribution of the sector to the country's economy (its high importance);

S2 - the presence of large reserves of hydrocarbon raw materials on the territory of Russia;

S3 - established and functioning infrastructure, including export;

S4 - low cost of oil production (break–even price - $15-20 per barrel) (2);

S5 - Russian oil companies are protected by the tax policy of the state from the volatility of commodity prices: according to the rules, with the fall in oil prices, the tax burden also decreases;

S6 - oil companies in Russia are protected by the weakness of the Russian currency, since they receive part of their income in dollars, but at the same time they bear expenses almost entirely in rubles;

S7 is a high share of state ownership, which means that it can be supported;

S8 – a high degree of social responsibility of the oil and gas business, especially in the regions where oil and gas companies operate;

S9 – the presence of scientific research structures among oil and gas companies; the interaction of industry companies with the scientific community; the expansion of platforms for discussing problems common to industry entities; the tendency to create intercorporate collaborations;

S10 – the availability of accumulated experience and technologies for the development of deposits of carbon-hydrogen raw materials located in various

geographical, climatic zones, and characterized by varying degrees of complexity of development;

S11 – hydrocarbon raw materials are the basis for the production of not only energy resources, the range of its use is wide and has great potential for expansion;

S12 – large reserves of heavy and viscous oil in areas with developed infrastructure (Western Siberia, Sakhalin, the European part of the country).

Weaknesses

W1 - a high level (relative to the level in individual countries) and an increase in the cost of oil production, a decrease in cost competitiveness;

W2 - the deteriorating structure of hydrocarbon reserves and their territorial location;

W3 - high dependence of profitability of production on world prices for hydrocarbons;

W4 - depletion of readily available hydrocarbon reserves, reduction of production at traditional fields, depletion of the resource base;

W5 - long payback period for investments in exploration and development of new reserves (10-15 years);

W6 - decrease in the quality of oil (deterioration of the physico-chemical characteristics of the extracted raw materials) exported through the system of main oil pipelines;

W7 - the sector's dependence on imported technologies, scientific and technological lagging behind global companies;

W8 - high degree of deterioration of infrastructure and fixed assets of industry companies;

W9 - a high share of state ownership, which means the possibility of using the income received from the oil and gas complex for other government needs;

W10 - limited underground storage capacity, low degree of protection from market fluctuations;

W11 - the predominance in the transport infrastructure of high-capacity pipeline transport aimed at Western countries, a limited fleet of tankers for maritime transport;

W12 - distance of new oil and gas provinces from potential buyers;

W13 - lack of infrastructural support for new oil and gas-bearing territories;

W14 – competition between oil and gas companies leads to their unavailability of joint technological developments;

W15 – a great number of main production processes in industrial enterprises are continuous, and their shutdown can lead to serious economic losses (losses);

W16 – insufficient attention is paid to the production of non-fuel petroleum products that are imported by consumers from other countries (for example, petroleum coke);

W17 – lack of technologies and capacities for processing high-viscosity oil;

W18 - low level of geological exploration of new mining areas, primarily Eastern Siberia and Yakutia, as well as the continental shelf of the Arctic seas (30).

Opportunities

O1 -development of equipment and technologies for exploration, production and processing of hydrocarbon raw materials;

O2 - availability of preferential tax regimes that take into account the geography of the location of deposits, composition and depletion of the resource base;

O3 - the growing demand for high-conversion products (polyethylene, plastic, varnishes, etc.) from oil;

O4 - a conservative state strategy for the transition to green energy, reducing the volume of state support for projects based on renewable energy sources (in 2021 compared to the planned level);

O5 - development of alternative energy, in particular, based on the use of hydrogen, liquefied gas;

O6 - growth in demand for hydrocarbon energy carriers in Asia-Pacific countries, China, India;

O7 - development of the hydrogen fuel market, for the production of which hydrogen raw materials are used;

O8 - inertia of demand for petroleum products in the transport sector, projected growth in demand for petroleum products in the future;

O9 - decline in hydrocarbon production in the Asian region (due to depletion of reserves) and Europe;

O10 - devaluation of the national currency, which leads to a decrease in production costs;

O11 – a special military operation to denazify Ukraine, and, as a result, an increase in energy needs in places of military operations and enterprises of the defense and related industries;

O12 – the geopolitical crisis as a trigger for a radical change in national policy regarding hydrocarbons from export-raw materials to innovative production; government support for basic industries.

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Threats

T1 - the policy of decarbonization of the global economy, assuming a reduction in oil demand in the future (12);

T2 - cheaper technologies based on renewable energy sources, high potential for cheapening in the future;

T3 - the presence of serious competition from Saudi Arabia and the Persian Gulf countries, which have lower oil production costs due to better geological and climatic conditions;

T4 - high degree of volatility of hydrocarbon prices on world markets, unfavorable price environment on world hydrocarbon markets (10, 14);

T5 - a significant share of fiscal charges in the cost structure of coal mining, lack of tax stability in the country;

T6 - sanctions measures against the use of foreign technologies and high-tech equipment, import substitution policy;

T7 - the policy of quota supply to the world market, implemented by OPEC+;

T8 is a technological trend to increase the energy efficiency of the use of oil and petroleum products (reducing the average specific fuel consumption per 100 km run);

T9 - development of inter-fuel competition of alternative fuels with petroleum products (especially in the transport sector);

T10 - possible refusal to lend to new oil production projects by international and European financial institutions, which will create additional difficulties in the field of exploration (33);

T11 - high cost of capital (due to high country risks), which makes projects for technological modernization of the industry unattractive;

T12 - decommissioning of unprofitable primary oil refining that is not provided with secondary refining processes;

T13 - the threat of a "slowdown" in economic growth in Asian countries(23);

T14 is a special military operation aimed at denazification of Ukraine, and, as a result, geopolitical challenges to the sector through the deformation of the global market situation, intensification of efforts to find effective renewable energy sources;

T15 – underdevelopment of consumer industries of gas chemical products and significant volumes of imports of such products;

T16 –additional capital investments are required for the deconservation of wells (mothballed to fulfill Russia's obligations to reduce oil production under the OPEC+ agreement;

As an important remark regarding the above lists, it should be noted that the threats and opportunities, as well as the strengths and weaknesses of the oil and gas complex, are given without taking into account their rank (significance, importance). The author believes that all the above components are significant, taking into account the seriousness of the problem being solved, their number can be considered sufficient for strategic analysis and, therefore, conducting a procedure to assess the significance of each of the components and leveling the insignificant ones can be neglected.

At the same time, according to the author's logic, the procedure for conducting a SWOT analysis should be supplemented with the "threats → opportunities" stage, which provides for considering threats to the external environment from a different angle, that is, the stage of searching for opportunities in threats. At this stage, it is possible to implement a strategic vision to a certain extent and get a non-trivial view of the current situation (1, 3, 7). A fragment of the author's conduct of such a research is contained in Table 2.

Table 2: Threats → Opportunities (*fragment*).

Threat	Opportunity
T1 – the policy of decarbonization of the global economy, assuming a reduction in oil demand in the future	The opportunity of finding a reduction in the carbon footprint from the use of hydrocarbons; the development of CO2 capture technologies
T2 – price reduction of renewable energy technologies, high potential for cost reduction in the future	The opportunity to search for technical, technological, organizational and managerial solutions to the problem of reducing the cost of target products in all parts of the value chain; actualization of non-price competitive advantages of hydrocarbons
T6 - sanctions measures regarding the use of foreign technologies and high-tech equipment, import substitution policy	The opportunity of developing domestic technologies, reviving individual sectors that provide the oil and gas complex with technologies, equipment, etc.
T7 - the policy of quota supply to the world market, implemented by OPEC+	The opportunity of developing production of high-value-added products within the country, which

	will lead to an increase in national independence from foreign manufacturers of similar products, as well as allow these products to enter world markets and compensate for the loss of export revenue in the oil and gas complex
T8 - technological trend to increase the energy efficiency of the use of oil and petroleum products (reduction of average specific fuel consumption per 100 km run)	The opportunity to slow down the growth of total global energy consumption in the future to ensure the commissioning of new fields that are not large in size and require significant time and financial costs for development
T9 - development of inter-fuel competition of alternative fuels with oil products (especially in the transport sector)	The opportunity of an increase in demand for hydrocarbon raw materials for electricity production (to fill the demand for refueling electric vehicles), for hydrogen production, for the production of blades for wind turbines, etc.
T10 - possible refusal to lend to new oil production projects by international and European financial institutions, which will create additional difficulties in the field of exploration	The opportunity of attracting public funds to solve the problems of financing and risk of exploration projects and the development of a basic and strategically important industry

As part of a comparative critical analysis of the identified external and internal determinants that define the development of the domestic oil and gas complex, a significant range of recommendations has been developed, a fragment of which is presented below:

1. Formulation of specific requests to the research sector in relation to the development of hydrogen energy.
2. Orientation of export supplies to the eastern direction;
3. Preparation of mining and processing facilities in Eastern Siberia;
4. The formation of appropriate transport capabilities, including the strengthening of the tanker fleet;
5. Further improvement of tax regulators: adjusting the tax burden within the industry value chain;
6. Formulation of specific requests to the research sector in terms of optimizing production costs, development of hard-to-recover reserves (HRR);
7. Stimulating the search for innovative (technological) solutions that ensure effectiveness in the short and medium term (with a fast payback period) to increase the investment attractiveness of projects / industries;
8. Large-scale implementation of digital technologies to optimize business processes, reduce risks (9);
9. and others.

4 DISCUSSION

The significance of external threats to the further development of the oil and gas sector in combination with the accumulated internal problems of the complex determines the inevitability of a decline in its volume indicators in the long term. As noted earlier, the range of perspective varies among individual scientists, specialists, and experts. However, few of them make forecasts for more than 2050. In this situation, taking into account the peculiarities of the oil and gas complex (significant inertia, high capital and capital intensity, etc.), it is already advisable to develop a clear strategic line and provide for variability of solutions taking into account risk factors. In this case, there is a peculiar crisis characterized by the fact that the need to ensure the stability of a larger system (global and national economies) threatens the sustainability of the development of the embedded system (oil and gas complex). At the same time, the development of the embedded system may not provide for an increment in quantitative indicators (it may be stabilization or reduction), but it may indicate the transition of the system to a qualitatively new state (a change in the structure of the sector (for example, an increase in the share of the gas component with a reduction in oil) and the search / transformation of the role structure (the use of oil and gas for non-fuel purposes)).

Using the terminology of the classics of strategic management, we can talk about the priority of the reduction strategy ("harvest") for the considered sector of the economy. Moreover, bearing in mind the high importance of the oil and gas sector for the domestic economy, including in the geopolitical sphere, one of the targeted strategic objectives for its development should provide for smoothing / slowing down this decline (reduction). However, with all the

seemingly obvious implementation of the folding strategy, the author offers an alternative option – the implementation of a combined strategy uniting elements of concentrated and integrated growth.

Integration processes take place permanently at the level of individual oil and gas companies. Integration growth strategies allow organizations to achieve various goals, accompanied, as a rule, by additive and multiplicative effects: the effect of scale, ensuring competitive advantages, information effect, etc. At the same time, it is interesting that oil and gas companies began to apply integration measures starting in the mid-70s of the twentieth century, in response to the negative consequences of the first oil crisis, which caused the manifestation of uncertainty in world oil prices. Integration was a kind of organizational mechanism for transforming the business model, allowing to optimize costs (primarily transaction costs) and more effectively use all the resource capabilities of companies, build portfolio strategies (5). Subsequently, under the influence of universal globalization, reverse processes occurred - companies allocated non–core activities, implementing outsourcing schemes, focusing on opportunities specializations. At the level of the domestic oil and gas complex, this led to the fact that, for example, oilfield service segments, which were successfully occupied by foreign companies and, accordingly, technologies, turned out to be "non-core" for the complex. The domestic non-industrial engineering industry has also significantly lost ground (4).

Currently, after a difficult pandemic period and as a result of the aggravation of geopolitical relations, we observe the beginning of the post-globalist era, characterized by the strengthening of the concept of sovereignty (6), the need to ensure a certain autarky and self-sufficiency of the national economy in key areas of life support for the population. Certainly, the oil and gas complex belongs to the main system-forming sectors that ensure, first of all, the energy security of the country and act as a basis for the functioning and further development of the domestic economy.In the context of new external challenges, the author sees it expedient to return to the model of integrative development, but no longer at the level of individual corporate entities, but at the sectoral level to ensure the sustainability of the complex's functioning, as well as the energy and economic security of the country.

At the same time, the strategy of concentrated growth should remain fundamental, combining almost all possible options for its implementation. Thus, it would be advisable to develop the segments of oil and gas processing and petrochemistry (production of high-value-added products) in order to reduce dependence on export revenues from the sale of hydrocarbon raw materials and imports of similar high-grade products produced abroad (product development strategy). It will also contribute to reducing the share of the use of hydrocarbons as energy carriers and leveling the impact on the oil and gas complex of the threat from the emergence of alternative energy sources. In addition, as a result of the implementation of this strategy, the carbon footprint from the use of traditional energy/fuel sources is expected to decrease (12).

Along with this, within the framework of the "improve what you are already doing" strategy (strengthening market positions), it seems advisable to implement a set of measures to ensure the reproduction of the raw material base (to create conditions for the long-term sustainability of the complex's functioning), as well as to maintain the level of costs, and, consequently, hydrocarbon prices. In this case, the technological development and implementation of practices for finding reserves and losses and eliminating them in all parts of the value chain in the oil and gas complex (exploration, production, transportation, etc.) can be noted as priority areas.

5 CONCLUSION

The presented research demonstrates the author's vision of solving the problems of updating the tools of strategic analysis. In particular, the importance and expediency of convergence of individual tools (SWOT, PEST analysis) and their modification in accordance with changes in management paradigms are determined. In particular, it proves the need, when using strategic analysis tools, to shift the focus from developing solutions that adapt the activities of the research object to external conditions to forming a system of measures to create the necessary conditions for the implementation of strategic statements (missions) the analyzed object (in this case, the oil and gas complex).

Based on the systematization of external and internal conditions and factors influencing the development of the complex under consideration, the author's recommendations on the choice of a basic strategic trajectory are presented. Integration and concentrated growth are highlighted as priorities, the optimal combination of which can lead

to synergistic effects and will help to neutralize many threats that determine the prospects for the development of the oil and gas complex at the present time.

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