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PROBLEMS OF DIVERSIFICATION OF THE OIL AND GAS INDUSTRY OF UZBEKISTAN

Abstract: The article examines the current challenges of diversifying the oil and gas industry under conditions of the global energy transition and instability in world hydrocarbon markets. The authors made the analysis of the dynamics of Brent crude oil prices, decline in oil production volumes in Uzbekistan, and the growth trends in renewable energy. The necessity of transitioning from a raw-material-based development model to a multi-sectoral structure with high added value is substantiated. The experience of Russian companies PJSC Rosneft and PJSC LUKOIL in the field of business diversification is examined. Particular focus is placed on the Uzbekistan's public initiatives aimed at developing renewable energy sources and deep hydrocarbon processing. Economic and regulatory measures are proposed to stimulate the diversification of the oil and gas complex with a view to ensuring sustainable development and the transition to a green economy.

Key words: diversification, energy transition, sustainable development, renewable energy sources, price volatility, investment policy, Uzbekistan, green economy.

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Introduction

The oil and gas industry continues to hold its status as one of the foundational elements of the global economy, serving as a guarantor of energy security and a driver of industrial growth for many states. However, in recent decades the industry has confronted a number of essential challenges capable of transforming its traditional structure. Among the most significant problems are the depletion of easily accessible deposits and declining production volumes, sharp price fluctuations in global hydrocarbon markets, and the growing anthropogenic impact on the environment. The combined effect of these factors calls into question the efficacy of the industry's previous operating model and necessitates the search for new strategic solutions.

The relevance of this study is conditioned by the transformation of the global energy system, rising price instability in the hydrocarbon sector, tightening environmental requirements, and the development of alternative energy. Under these conditions, the traditional raw-material model of the oil and gas industry is losing its stability, which increases the importance of diversification as a key direction of its strategic development. For Uzbekistan, this issue is of particular significance, as the oil and gas sector remains a substantial component of the national economy. The relevance of the present work is further confirmed by Resolution №PR-57 of the President of the Republic of Uzbekistan, dated 16 February 2023 "On measures to accelerate the introduction of renewable energy sources and energy-saving

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technologies in 2023” [5]. State energy policy is oriented toward the modernization of the industry, the development of deep hydrocarbon processing, the expansion of renewable energy, and the transition to a more sustainable growth model. This confirms the scientific and practical significance of research into the diversification of the oil and gas complex under contemporary conditions.

The objective of this article is to substantiate the necessity of diversifying the oil and gas industry in the context of global energy transformation, as well as to develop practical recommendations for stimulating the transition of Uzbekistan's oil and gas complex toward a more sustainable and multi-sectoral development model.

Research Methodology

The methodological foundation of the study comprises the principles of economic theory, concepts of sustainable energy development, and scholarly works in the field of strategic management of the oil and gas sector. A comprehensive approach was employed, enabling the examination of industry diversification as an element of the global transformation of energy markets.

In the research process, the methods of analysis and synthesis have been applied to examine trends in the development of the oil and gas industry; comparative analysis has been used to assess the characteristics of the energy sector's development in

Uzbekistan; and statistical methods have been employed to evaluate the dynamics of hydrocarbon prices and structural changes in the energy sector.

Theory and Analysis

The oil and gas industry has traditionally constituted one of the foundational sectors of the global economy, ensuring the energy security of states and generating a significant share of export revenues. However, contemporary conditions are characterized by increasing instability in global energy markets, fluctuations in oil prices, declining hydrocarbon production, environmental constraints, and the accelerating energy transition.

Under these conditions, diversification of the oil and gas industry becomes the most critical strategic development direction. It enables a reduction in the economy's dependence on raw material exports, enhances the industry's resilience, and ensures its adaptation to new global challenges.

Production diversification in the oil and gas complex refers to the simultaneous development of numerous unrelated types of production and the expansion of the product range within a single enterprise. Diversification is applied for the purpose of improving the operational efficiency of oil and gas organizations, generating economic benefits, and preventing insolvency.

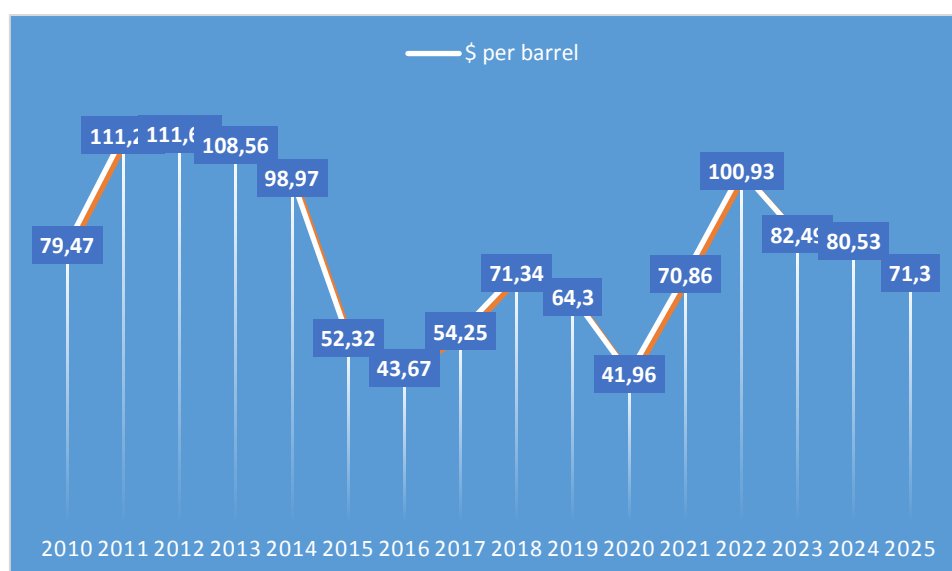


Figure 1. Average annual Brent crude oil price [7]

Figure 1 illustrates the dynamics of the average annual Brent crude oil price over the period 2010–2025 (in US dollars per barrel). Throughout the period under review, significant price fluctuations are observed, reflecting the instability of the global oil market.

At the beginning of the decade, prices were at a relatively high level - in the range of USD 79–111 per barrel (2010–2013). However, from 2014 onward, a sustained decline in prices began, reaching a minimum of approximately USD 43–52 per barrel in 2015–2016. Following a partial recovery in 2017–

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2019, another sharp price decline occurred in 2020, after which the market gradually stabilized, reaching a peak of approximately USD 100 per barrel in 2022. In subsequent years, a renewed tendency toward moderate price decline was observed. The causes of declining oil prices include reduced global demand for energy resources, the development of alternative energy, and geopolitical and economic factors [1].

One of the reasons necessitating the diversification of the oil and gas industry is the

growing utilization of alternative energy sources. Alternative energy sources are a type of environmentally clean, renewable resource whose conversion yields electrical and thermal energy without generating the greenhouse effect that arises from the use of oil, gas, and coal. Accordingly, the development of renewable energy sources in Uzbekistan is regarded as one of the key directions of state energy policy.

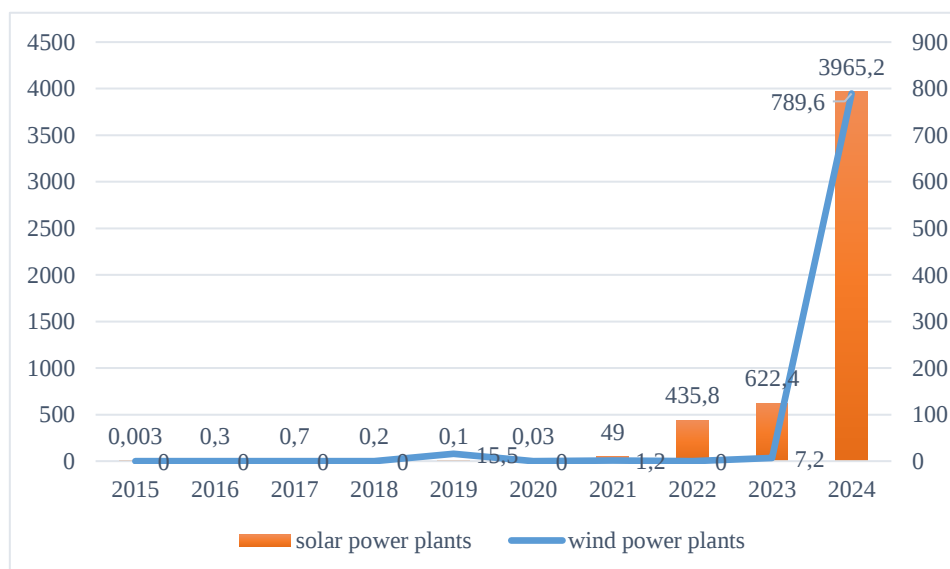


Figure 2. Volume of electricity generated by solar and wind power plants, million kWh [2]

As Figure 2 demonstrates, over the past three years the volume of electricity generated by solar and wind power plants has increased significantly. In 2024 in particular, the volume of electricity generated by solar power plants amounted to 3,965.2 million kWh, while that generated by wind power plants amounted to 789.6 million kWh.

By 2030, it is planned to increase the share of electricity from renewable energy sources to 54%. In addition, the creation of additional “green” energy capacity with a total volume of approximately 19,000 MW is envisaged, which opens new opportunities for oil and gas companies to participate in emerging segments of the energy market. Experts hold that the use of alternative sources will grow and become increasingly prioritized. All of this, in turn, underscores the relevance of diversifying the activities of major oil companies [6].

Illustrative examples may be found in Russian oil and gas corporations such as PJSC Rosneft and PJSC LUKOIL. The operational structure of PJSC Rosneft comprises various structural subdivisions organized according to the following types of activity: exploration, production and development, refining, sales, and services. One of the corporation's diversification directions is its participation in joint oil

and gas projects with other corporations. PJSC LUKOIL encompasses the following business lines: oil and gas exploration, oil and gas production, oil refining, gas processing, and sales. Since 2015, the company has been engaged in solar and wind power generation. In the second quarter of 2020, revenues from this line of business accounted for less than 7% of the company's total revenue; consequently, the formation of an investment portfolio was proposed with the aim of increasing the company's share of revenue from alternative energy generation activities and reducing dependence on economic risks [1, 3, 4].

The necessity of diversifying the oil and gas industry is also conditioned by the fact that oil production volumes have declined substantially (Figure 3).

The data presented demonstrate a sustained downward trend. Whereas in 2010 production amounted to 2 017.9 thousand tones, by 2024 the indicator had declined to 713.1 thousand tones - a reduction of nearly 2.8 times. The most pronounced decline occurred in the early years of the period under review; thereafter, the rate of decline slowed, yet previous production volumes were not restored. The identified dynamic may be associated with the

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depletion of deposits and structural changes in the energy sector.

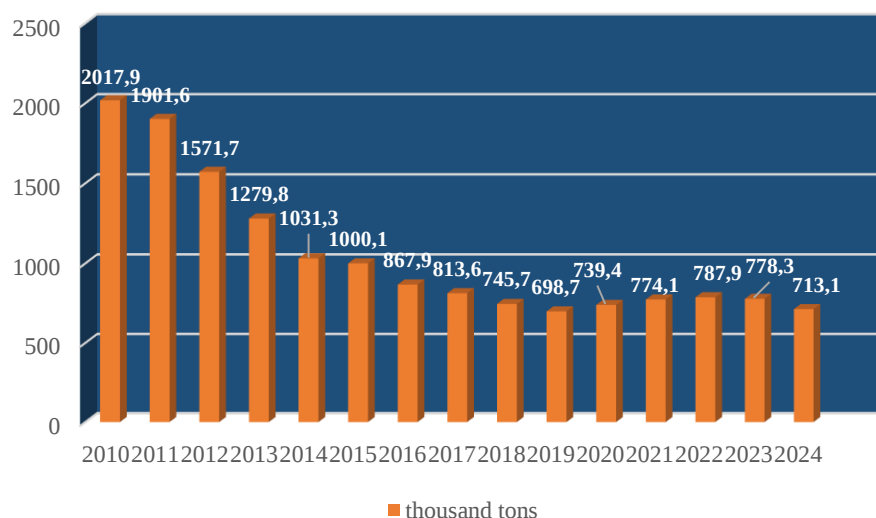


Figure 3. Oil production volumes in Uzbekistan for 2010–2024 [2]

Further evidence of the necessity for oil and gas industry diversification is provided by the expansion of international cooperation and the development of deep hydrocarbon processing projects. In particular, the Malaysian company Petronas is implementing natural gas processing projects in Uzbekistan. The participation of foreign investors facilitates the introduction of advanced technologies, improves the efficiency of raw material processing, and enables the creation of products with higher added value. This reduces the industry's exclusive dependence on oil and gas extraction and promotes the formation of a sustainable development model for the oil and gas complex. Such initiatives are consistent with global energy transformation trends and confirm the strategic importance of diversification for the long-term stability of the industry [8].

Results

The study conducted permits the following generalizing conclusions to be drawn.

First, the current state of the oil and gas industry is characterized by a high degree of uncertainty and instability. The volatility of global oil prices, the accelerated development of renewable energy sources, and the tightening of environmental requirements are creating new operating conditions for the industry, under which the traditional raw-material model loses its long-term sustainability.

Second, the statistical analysis of Brent crude oil price dynamics and the decline in oil production volumes in Uzbekistan confirms the objective necessity of structural transformation of the oil and gas complex. Declining production and the

dependence of revenues on price conditions exacerbate macroeconomic risks.

Third, the development of renewable energy in Uzbekistan and the target of raising its share to 54% by 2030 create new avenues for the diversification of oil and gas companies' activities. Participation in solar and wind energy generation projects, as well as in the deep hydrocarbon processing segment, enables the generation of additional added value and reduces dependence on raw material exports.

On the basis of the research conducted, the following recommendations may be proposed:

- the establishment of a specialized oil and gas industry diversification fund that accumulates a portion of the revenues derived from petroleum product exports. The fund's resources should be directed toward partial coverage of capital expenditures (CAPEX) for initial renewable energy source projects;
- the modernization of the feed-in tariff system through the introduction of "green" premiums of 10–20% for energy projects implemented by diversified oil and gas companies. This would create additional economic incentives for major industry players to enter the renewable energy segment and would enhance investment attractiveness;
- the introduction of regulatory incentives providing for the mandatory investment of 5–10% of oil and gas companies' net profit in renewable energy, energy efficiency, or deep hydrocarbon processing projects. Where the established threshold is exceeded, tax concessions, accelerated equipment depreciation, or preferential licensing terms may be granted.

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Conclusions

The study conducted confirms that diversification of the oil and gas industry represents an objectively necessary development direction in the context of the global energy transition and the instability of world markets. The volatility of hydrocarbon prices, the tightening of environmental requirements, and the growth of alternative energy are

shaping new realities in which the traditional raw-material model is losing its resilience.

Thus, diversification serves not merely as a risk minimization instrument, but as a strategic foundation for the long-term sustainability and technological renewal of the oil and gas complex, enabling companies to adapt to changing conditions and maintain competitiveness in the era of energy transformation.

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