THE REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

THE PRINCIPAL DIRECTIONS OF THE DEVELOPMENT OF OIL AND GAS INDUSTRY OF AZERBAIJAN IN THE STATE OF GLOBALIZATION

Specialty:	5312.01 – "Sectoral Economics"
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GENERAL DESCRIPTION OF WORK

Urgency of the research topic and the degree of development. International practices demonstrate that the energy resources in a country are the guarantor with respect to its political independence, economic security and revival. As to the range of energy resources, crude oil and gas dominate and will undoubtedly remain so for a long time. The Almighty God has blessed Azerbaijan with great mineral wealth. Nowadays, Azerbaijan is among the regions of the world with rich oil and gas resources. Azerbaijan's economy integrates to the globalized world economy, primarily due to its oil and gas factor. Historical experience shows that the country's oil and gas projects play an exceptional role in raising the population's living standards and laying the foundation for the private sector as well as long-term economic development.

Factors such as effective use of natural resources, environmental protection, economic security, energy security, and efficient use of existing potentials, improvement of corporate management in oil and gas industry, and provision of sustainable economic development are among the measures aimed at national interests in the country. The dependence of the country's economy on oil and gas revenues is an undeniable fact. Thus, more than 50% of the state budget revenues are provided at the expense of the oil and gas sector.

Referring to the vision of the President of the Republic of Azerbaijan Ilham Aliyev: *"We have to use the oil factor very skillfully so that the economy of Azerbaijan develops comprehensively and our future generations do not depend on the oil factor"*.[1] This view of Mr. President and the ones listed above reflect the relevance of including the directions of using the oil and gas factor in the subject of scientific research in strengthening the country's economic and political security. Innovative changes in oil and gas industry should be made in order to implement the strategy of ensuring sustainable development, as stated in the "Strategic Roadmap for the perspective of the national economy" (2016) and

[1] Ilham Aliyev, "Development is our goal", book 9, Azernashr, Baku, 2012, p. 181

"Azerbaijan 2030: Priorities of socio-economic development" (2021).

The immediate correlation of the development of the country's oil and gas industry with the main problems of modern world economy (globalization, demographic, resource, financial, technological, ecological) should be considered.

As challenging environments dominate in the international markets, the state should implement a number of effective measures in the context of supporting the national economy, including the oil and gas sector. Among these measures, supporting business initiatives in the sphere of investment and innovation, digitization, as well as measures aimed at ensuring energy security should occupy an important place. Among them, such as lowering the cost of oil and gas, optimizing non-production and management costs, expanding innovation activities, stabilizing the position of Azerbaijan's energy system in international markets, further strengthening the role of the oil and gas sector as a whole, measures related to the country's economic and environmental security and sustainable development refers to the problems waiting to be solved and justifies the relevance of the topic of the dissertation.

The development of the oil and gas industry and related organizational, economic and social problems, the impact of this field on the environment, the role in the progress of non-oil sector, the investment attractiveness of the field, innovation activity and other problems have been widely studied by Azerbaijani scientists.

The availability of rich oil and gas fields discovered in the country and in the Azerbaijani sector of the Caspian Sea as a result of the work of several generations of Azerbaijani oil workers is the basis of today's and future achievements of our people. Azerbaijani scientists, geologists, and oil workers who lived in the past and are our contemporaries have implemented valuable work for the discovery of our natural resources and laid the foundation for the continuous development of our independent Azerbaijan today and tomorrow. In the mentioned context, the geological, technical and technological problems of the oil and gas industry in our republic has been widely studied in the scientific researches of M.Abbasov, A.Alikhanov,

A.Alizade, A.Amirov, M.Isgandarov, A.Mirzajanzade, Sh.Mehdiyev, S.Orujov, F.Salmanov, Seyid-Rza Karimoghlu, G.Abbasov, X.Yusifzadeh, I.Guliyev, A.Alizadeh, F.Kadirov, Ch.Sultanov, F.S.Ismayilov and others.

The role of the oil and gas industry in the socio-economic life of the Republic, its management, aspects of the assessment of oil and gas reserves is reflected in the works of Z.Samadzadeh, and A.Nadirov who are full members of ANAS, and G.Imanov, A.Musayev, and A.Nuriyev who are correspondent members of ANAS, as well as, A.Alibayova - Doctor of economic science, the first woman to receive the scientific title of professor in the field of economics in the East, including professors Sh.Samadzadeh, E.Guliyev, I.Aslanzadeh, M.Atakishiyev, B.Atashov, M.Ahmadov, T.Aliyev, N.Aliyev, R.Aliyev, E.Hajizadeh, Y.Hasanli, A.Huseynov, T.Huseynov, R.Isgandarov, Y.Kalbiyev, Sh.Gafarov, S.Gasimov, M.Mammadov, V.Novruzov, F.Rahmanov, G.Safarov, G.Yuzbashova and other scientists.

Theoretical and methodological issues related to this topic has been researched by Russian and other foreign researchers such as L.Abalkin, N.Baibakov, K.Bezuglova, C.Bogdanchikov, A.Bulatova, N.Voronina, B.Glushchenko, M.Kastels, E.Malyshev, M.Porter, O.Cherkovets, A.Samir, N.Amstrup, M.Ayub, M.Friedman, D.Kim and important recommendations have been made.

Without detracting from the theoretical, scientific and practical significance of the problems studied by these scientists, it should be noted that in the context of globalization, energy security, efficiency and optimization, business sustainability, long-term activities, as well as, the recent strategic priorities in its fields, including the role of SOCAR’s activities in strengthening the sustainable economic development of Azerbaijan and the main spheres of influence, based on digitalization, have not been comprehensively studied, starting from the previous period of development of the oil and gas industry and economic entities of the field in our country. All this determines the relevance and justifies the selection of the research topic and specification of the set goals and objectives.

Purpose and objectives of research.

The object of the study is the oil and gas industry of the Republic of Azerbaijan and its flagship SOCAR's field of exploration and geological exploration, oil and gas production - upstream activity.

The subject of the research is the scientific investigation and mechanisms of the strategic development possibilities of oil and gas industry, which ensures the economic development of the country in the conditions of globalization.

Research methods. Modeling, mathematical-statistical, systematic and complex approach, graphic, structural-functional, comparative analysis, analytical generalization and other mathematical-economic methods were used in the research work.

Purpose and objectives of research.

The purpose of the study is to discover the main trends and prospects of economic development and develop recommendations based on energy security, field efficiency and optimization, business sustainability and digitalization in the aspect of the country's economic progress of oil and gas industry in the upcoming years, and to make a scientifically based theoretical and practical proposal for the fulfillment of strategic goals in the long term.

To achieve the stated goal, the following tasks were set and solved:

- to study the essence and theoretical-methodological aspects of economic development in modern conditions and to learn the role of oil and gas industry in the structure of the economy of the Republic of Azerbaijan;
- to analyze the position of the Republic of Azerbaijan in the world energy resources market and to formulate directions for increasing the country's competitiveness;
- In the context of multilateral cooperation in the field of energy between the Republic of Azerbaijan and the European Union, to highlight the export possibilities and limits of the country's hydrocarbon resources;
- to assess the impact of economic entities of oil and gas industry on the provision of economic development and the identification of relevant reserve opportunities;

- to assess the impact of the oil and gas industry on the country's non-oil sector based on mathematical and statistical models;
- to study the application of the efficient operating model in SOCAR's internal operations;
- to determine the main directions of the long-term strategic development of oil and gas industry in the global industrial context;
- to classify the main strategic goals and main priorities in the development of Azerbaijan's oil and gas industry.

The principal provisions submitted for defense:

– A review of theoretical and methodological views on the complex of measures and the relevant action strategy for ensuring economic progress in the conditions of globalization, the essence of global economic development and the factors that determine it, the place and role of Azerbaijan in the development of the world oil and gas industry, the models of the development of the oil and gas industry and their distinguishing features investigation should be considered;

– The role of oil and gas production areas in the economic development of our country, evaluation of economic efficiency indicators of oil and gas production;

– Determining the possibilities of quality management and use of oil and gas revenues;

– Formulation of a strategy that ensures the economic progress of the country, within the framework of the field or enterprises, development of progressive mechanisms in the direction of implementation of sustainable and innovative activity on its object, as well as digitization;

– Assessment of Azerbaijan's hydrocarbon reserves and ramping up the production of fossil fuels, the economic impact of directing the income from oil and gas sales to the non-oil sector is of paramount importance with mathematical-statistical models;

– In modern conditions, during the implementation of Azerbaijan's oil and gas strategy, there is a need to determine the main priority directions of digitization, the application of an effective

operator model in internal operations, and the long-term strategic development of the oil and gas industry in the context of the global industry.

Scientific novelty of the research lies in the fact that, the role of the oil and gas industry in ensuring the progress of Azerbaijan in the new economic conditions is comprehensively analyzed and evaluated, and the development of main directions and mechanisms aimed at ensuring the modernization and sustainable development of the oil and gas industry in the country in the long term.

– In order to assess the current state of the oil and gas industry, the theoretical and methodological views, which include various research methods and take into account numerous factors, have been put forward.

– In the conditions of globalization, the possibilities of increasing the competitiveness of Azerbaijan's oil and gas industry in the world energy resources market have been substantiated.

– Based on a systematic approach, the dependences between the amount of oil and gas revenues directed to the non-oil sector, the value of the main funds, and the human development index were worked out with mathematical-statistical models;

– The strategic goals of SOCAR and their priorities for the long-term period were classified, the development of Azerbaijan's oil and gas industry was proposed to be adapted to modern requirements, and the main trends of sustainable development of the field were indicated.

– Taking into account that the mechanism for the development of the oil and gas industry should be based on the global information environment and that modern digitalization should be widely used in all managing and managed systems, the main schemes of that mechanism were proposed, and the idea that digitalization should be reflected in all links from exploration to the sale of oil was put forward, strategy, capabilities and operational priorities have been set forth as foundational supporting initiatives similar to digital transformation initiatives such as SOCAR's digitization concept.

– Taking into account the influence of global crises of management trends (functional restructuring, flexibility, etc.) in the

oil and gas industry, a new management model was proposed for "Azneft" Production Union, based on an efficient operating model in internal operations.

– Taking into account the international experience, considering the wide scope of SOCAR's activities within the country and the fact that there is no upstream activity outside the country, SOCAR's long-term expansion opportunities have been shown by carrying out this activity in Eastern Europe, the Caspian region and the Middle East.

Theoretical and practical significance of the research.

The theoretical importance of the research is that its main provisions, results, proposals put forward and recommendations can be used to ensure the strategic development of the oil and gas industry, enrich future research as a different methodological approach. The practical significance of the research lies in the fact that it can be used as an alternative source contributing to the development of relevant field and state programs, strategies and concepts, improvement of the management mechanism, cost management, increasing the production of innovation-oriented products and ensuring digitization.

Approbation and application of work.

In the course of the research, the subject of the dissertation work was, as an actual problem, discussed in scientific workshops, which are constantly operating, in accordance with the general directions of scientific research works of the "OilGasScientificResearchProject" Institute.

The main provisions of the work have been published in 11 scientific works, including 8 articles, 4 proceedings, in prestigious magazines recommended by SAC (Supreme Attesstation Commission). Among them; "Oil and gas strategy" and realities: Oil and gas revenues are a guarantee for restoration and construction works in territories liberated from occupation", (Baku, 2023), "Digitization in oil and gas companies in the industrial context", International scientific and practical conference" Modern management and socio-economic aspects of the development of the state, regions and subjects management in conditions of transformation public administration", (Odessa 2023),

"Characteristics of modern globalization", XV international scientific and practical conference of young scientists and educators" Current problems and perspectives of the development of accounting, analysis and control in the globalization of the economy, (Lutsk, 2023) and "Paths of improvement of innovational activity in oil and gas industries" (Baku, Scopus, 2021), "Innovative development of oil & gas industry: role of environmental taxation (Ukraine, WOS, 2021), "Tendencies of innovative development in the oil and gas industry", (Baku, 2022), "Economic effect of direct foreign investments in the oil and gas sector of Azerbaijan", (Baku, Scopus, 2023) , "Aspects of the application of an effective operator model in internal operations", (Baku, 2023) and others.

The methodical approaches, algorithms, principles, research results and practical recommendations developed during the research were presented to the ASOIU (Azerbaijan State Oil and Industry University), "Economic problems of the development of oil and gas fields", "Strategic management in business" at the master's degree level of education in the "Industrial economy" and "Management" departments, "Corporate management in industry" and others and it was considered appropriate to be used in teaching of subjects, in the implementation of scientific-research works, in the preparation of teaching-methodical works (Act No. 3-29-50/2-29/2024 dated 12.01.2024).

The name of the institution where the dissertation work was performed. The work was carried out at "OilGasScientificResearchProject" Institute of the State Oil Company of Azerbaijan Republic.

The total volume of the dissertation with a sign, indicating the volume of the structural units of the dissertation separately.

The total volume of the dissertation is (276413 symbols), including cover page and table of contents (2557 symbols), introduction (14263 symbols), chapter I (75053 symbols), chapter II (52348 symbols), chapter III (70743 symbols), conclusion (8560 symbols) and bibliography (20138 symbols). Without taking into account graphs, tables, diagrams and the list of used literature, the volume of the dissertation is 224,287 symbols.

SHORT SUMMARY OF WORK

In the "Introduction" part of the dissertation, reasons are given for the relevance of the topic, the goals and objectives of the research, the main propositions defended, research methods, scientific innovation, theoretical and practical importance, approval and application are reflected.

In the first chapter of the dissertation called **"Theoretical-methodological aspects of the study of economic development in the oil and gas industry"**, the main principles of ensuring global development, the classification of factors affecting economic development, and the studies determining the relationship of the country's economic development with other member parts were studied. Development models of the oil and gas industry and their distinguishing features have been identified and systematized.

It is clear that the theoretical and methodological foundations of scientific research are the main parameters for evaluating its objectivity. In our opinion, by preparing a working model that takes into account the main factors affecting the international economic cooperation in oil and gas industry of the Republic of Azerbaijan based on the theoretical and methodological principles that form the basis of this research, as well as concrete methods, it is possible to determine its future development directions.

In the short run, the process of globalization will be characterized by:

– integration of economic and information development of economies, creation of a single information and investment space;

– integration of markets, market management systems and production systems;

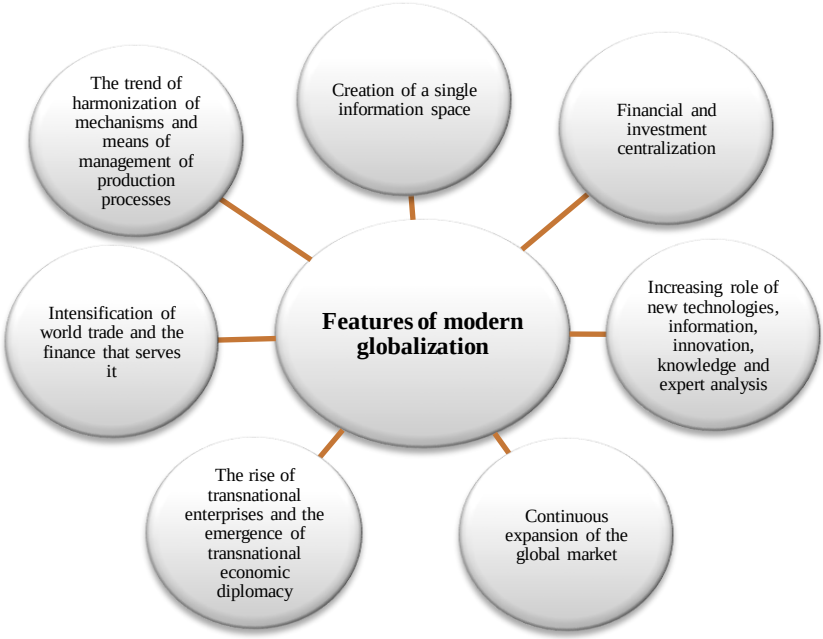
– further development of information and telecommunication technologies;

– creation of new investment technologies based on reliable information provision, strict legal regulation of investment decisions at the regional, international and interstate level;

– the use of high technologies in all spheres of life and production will require a fundamental re-equipment of the material

and technical base of all types of human activity, which will lead to significant changes in people's lifestyle and thoughts.

If earlier the success of entrepreneurship depended more on classic production factors, today this success is mainly determined by the integration of those factors with elements of knowledge, combined coordination of financial, informational and intellectual resources and includes the main characteristic features of modern globalization (Scheme 1).



Scheme 1. The main characteristics of modern globalization
Source: The diagram was developed by the author.

Globalization of the market is an important trend in the development of the world oil and gas industry. One of the most important consequences of globalization is the global level of competition, which necessitates the integration of oil and gas producing countries into the energy business.

Academician Ziyad Samadzadeh writes: *"The oil strategy developed at the end of the 20th century is extremely important for the strengthening of Azerbaijan's independence and the revival of other areas of the economy. Of course, this is not an easy process. But the republic, which some time ago had to coordinate every step it took in the field of foreign economy with the Union government, is now truly independent. It implements strategic programs that give remarkable results in terms of globalization and improves the management of this process step by step"*.[2]

The oil and gas industry in Azerbaijan is state-owned. Therefore, the state closely participates in creating optimal conditions for the operation of the oil and gas industry through administrative and fiscal regulation. The State Oil Company of Azerbaijan Republic (SOCAR) is a vertically integrated oil and gas management structure, divided into functional blocks and "streams". Rather, a common functionality and orientation is characteristic for certain segments of activity and forms a single production-value chain "from the well to the filling station". It should be noted that the standard distribution scheme of oil and gas companies accepted in the world is as follows:

- prospecting and geological exploration, oil and gas production - upstream;
- transportation of hydrocarbons, infrastructure integrity system - midstream;
- logistics, processing, commerce, trading - downstream.

Despite the fact that the history of oil and gas production in the Republic of Azerbaijan covers a long period and stages, the productivity prospects of oil and gas products, as well as the volume of hydrocarbon reserves, are quite high. We believe that the expansion of oil and gas production in the onshore areas of the Republic of Azerbaijan, as well as the discovery of new oil and gas deposits, can ensure high-quality oil and gas production.

The most fateful issue in the history of Azerbaijan's independence,

[2] *Azerbaijan's economic development strategy, Economist, 2013, No. 5,p.13.*

the most important factor in ensuring its economic independence, is the oil and gas strategy that determines the use of the country's rich natural resources. The main course of this strategy is the "Contract of the Century".

It is common knowledge that, on September 20, 1994, Azerbaijan's first international oil agreement - "Contract of the Century" - was signed for the Joint Development of the Deep Water Reserves of Azeri, Chirag and Guneshli fields on the basis of Production Sharing Agreement and foreign oil companies: BP (UK), Amoco (USA), LUKOIL (Russia), Pennzoil (USA), Unocal (USA), Statoil (Norway), MC Dermott (USA), Ramco (UK), TPAO (Turkey), Delta -Hess (Saudi Arabia) were involved in this process. SOCAR represented the government of Azerbaijan in the agreement. Oil reserves in the above-mentioned fields are 640 million tons, natural gas reserves are 100 bln. cubic meters, and the free gas reserve is 100-150 billion cubic meters, which is considered a huge field by world standards. It is planned that the maximum oil production will be at the level of 34-35 million tons per year by attracting foreign investment in the amount of 7.4 billion dollars for the exploitation of the indicated oil and gas reserves within 30 years. The main activities in the private share distribution in the national oil and gas sector are carried out by the Azerbaijan International Operating Company (AIOC). It includes 11 major oil companies from the 7 countries named above. AIOC carries out appropriate management in transnational communication lines and other infrastructure facilities such as The South Caucasus Pipeline with the operation of the "Azeri-Chirag-Guneshli" and "Shahdeniz" fields, as well as, Baku-Supsa, Heydar Aliyev Baku-Tbilisi-Ceyhan Main Export Pipeline and Baku-Tbilisi-Erzurum by the operatorship of "British Petroleum" oil company (BP).

In addition, the discovery of a large gas field in the Absheron and Umid blocks in the Azerbaijani sector of the Caspian Sea is of great importance in increasing the country's gas potential and facilitates the emergence of new geopolitical obligations. Along with the signing of oil and gas contracts, ensuring the diversification of oil and gas pipelines, the conceptual problems of energy security were also

reflected in the oil and gas strategy of the Republic of Azerbaijan and formed a basis for regionalization.

Second chapter of the dissertation, called **"Analysis of the current organizational and economic aspects that ensure the economic development of oil and gas industry of Azerbaijan",** investigates the assessment of the depletion of hydrocarbon reserves of Azerbaijan and the production level of fossil fuels, the new oil and gas strategy of Azerbaijan: the "Contract of the Century", the creation of its foundations and the analysis of its essence, the assessment of the economic impact of oil and gas production on the non-oil sector with mathematical-statistical models. For this purpose, tables, diagrams and graphs of various directions and purposes were prepared and research works, in accordance with new realities based on the national oil and gas strategy authored by national leader Heydar Aliyev and successfully implemented by President Ilham Aliyev, were fulfilled using numerous statistical indicators characterizing the state of the oil and gas industry. Azerbaijan, which is considered the world's temple of oil and gas production, has been integrated into the international energy security system for 30 years and has become an integral part of it.

In line with the State Program, complex drilling works based on advanced techniques and technologies are being carried out in 24 oil and gas fields belonging to the SOCAR system, including offshore and onshore areas, as a result of which the development of new oil and gas wells is intensifying. Data reflecting the dynamics of oil and gas production in Azerbaijan in 2000-2022 are given in table No. 1.

As can be seen from the table, in the last years there was a sharp decrease in oil production, and a dynamic increase in gas production. Separately, in 2022, compared to the previous year, 1934,0 tons less oil was produced, and its volume decreased to 32646 million tons. During this period, the volume of associated gas increased by 512 million cubic meters and made 15.4 billion cubic meters, which is 33.0% of the total volume of gas produced.

Table 1.

Dynamics of oil and gas production in Azerbaijan

	Years							
	2000	2010	2018	2019	2020	2021	2022	Growth in 2018-2022 (in %; times)
Oil (thousand tons including gas condensate)	14017	50838	38814	37501	34532	34580	32646	0,844
Marketable portion of it	--	50692	38722	37452	34465	34513	32570	0,843
Total Gas mln. m^3	5642	26312	30490	26487	37140	43867	46737	1,634
Marketable portion of it	--	16673	19207	24514	26487	32578	34956	1,922
Associated gas	2860	13943	14046	13578	28246	14912	15424	1,109
Marketable portion of it	--	4798	3500	3241	28246	4332	4227	1,028
Natural gas	2783	12370	16444	22032	23908	28955	31313	2,131
Marketable portion of it	--	11875	15707	21273	23161	28246	30729	2,183

Source: based on data of Statistical Indicators of Azerbaijan, The State Statistical Committee, Baku, "Sada", 2023, p. 780, compiled by the author.

For the long-term sustainable development of Azerbaijan's economy, maintaining the optimal oil production at 30-35 million tons per year, and gas production at 50-55 bln.m^3 would be appropriate in terms of cost management. Selling 70-80% of the produced oil and 50% of the gas to foreign consumers will allow our country to maintain its position in the global energy security system. In total, 34 agreements of "Production Sharing" type were signed between SOCAR and foreign oil companies during 1994-2023. In our opinion, by appreciating the achieved results, a number of new research, exploration, there is a need to carry out drilling and development works. Proposals in this regard have been put forward in the thesis work.

Research shows that while the volume of production in onshore fields is 2150.2 million tons of oil-condensate, 945.4 billion cubic meters of gas, including 981.2 million tons of oil-condensate, it is 139.7 billion cubic meters of gas, 1169 million tons of oil condensate, and 805.7 billion m^3 of gas from offshore fields in the Republic. 546.4 million tons of oil and 190.0 billion cubic meters of gas have been produced from the "ACG" field by AFC since 1997.

Since 2006, 35.8 million tons of condensate and 157.5 billion m^3 of gas have been produced from the Shah Deniz field (table 2).

Increasing gas production from the fields under development by the State Oil Company due to the intensification of the development of the "ACG", "Shahdeniz" and "Umid" fields, the domestic demand was fully met and Azerbaijan expanded its activity as a gas exporter.

In this chapter, at the same time, the structural changes carried out in the field of oil and gas recovery of our country during the former Soviet union period and the years of independence and the evaluation of its impact on the economic development of the state, the analysis of the impact of the formation of a new oil strategy on the basis of the "Contract of the Century" on the development of the field, the analysis of the impact of the innovation and investment guarantee of the oil and gas industry on the country's economy was conducted. In our opinion, during the 30 years since the signing of the "Contract of the Century", the successful implementation of the "New Oil Strategy" has become a reality and some of the achievements can be classified as follows:

1. Ensuring rapid access of Azerbaijan to the world energy market by attracting large investments from international oil corporations to oil and gas projects. In general, since the "Contract of the Century" was concluded, foreign oil companies have invested more than 100 billion US dollars in the oil and gas industry of Azerbaijan, which is an important factor in the development of the republic;

2. Creating a system of export pipelines for the purpose of free and fast access of Azerbaijan's oil and gas to world markets;

3. Collecting and increasing oil revenues for future generations, taking into account the requirements of progress and economic development, using them for the current social needs of Azerbaijan, as well as for the current generations;

Table 2.

Volume of oil and gas production introduced in natural numbers by "Azneft" PU and operating companies in the Republic of Azerbaijan

		01.01.2020	01.01.2022	As of start of development	Rate of change,%	Change (+,-)
Oil+condensate. thos. tonnes						
SOCAR	Offshore	5976,8	6236,1	539699,2	104,34	+259,3
	Onshore	133,1	360,2	333545,4	270,62	+227,10
	Total	6109,9	6596,3	873244,6	107,96	+486,40
on JV+OC	Offshore	199,1	199,9	47038,0	100,4	0
	Onshore	1098,3	1093,7	647680,4	99,58	-4,6
	Total	1297,4	1293,6	6694718,4	99,71	-3,8
ACG	Offshore	23555,5	22505,0	546438,2	95,54	-1050,50
Shahdeniz	Offshore	3576,2	4177,0	35794,7	116,80	+600,80
Republic overall	Offshore	33307,6	33117,9	1168970,1	99,43	-189,70
	Onshore	1231,4	1453,7	981225,8	118,05	+222,30
	Total	34539,0	34571,9	2150195,9	100,1	+32,90
including: Umid field	Offshore	170,9	173,5	828,7	101,52	+2,60
Gas mln.m^3						
SOCAR	Offshore	5836,1	6340,9	294441,0	108,65	+504,80
	Onshore	86,6	92,3	81824,1	106,58	+5,7
	Total	5922,7	6433,2	376265,1	108,62	+510,50
on JV+OC	Offshore	1328,7	1338,3	163715,0	100,72	+9,6
	Onshore	92,6	89,2	57838,1	96,30	-3,4
	Total	1421,3	1427,5	221553,1	100,44	+6,2
ACG	Offshore	11708,8	13361,8	190024,1	114,10	+1653,00
Shahdeniz	Offshore	18088,1	22642,0	157534,0	125,20	+4553,90
Republic overall	Offshore	36961,7	43683,0	805714,1	118,20	+6721,30
	Onshore	179,2	181,5	139662,2	101,30	+2,30
	Total	37140,9	43864,5	945376,3	118,10	+6723,60
including: Umid field	Offshore	1091,30	1115,00	5223,70	102,20	+23,70

Source: The table was compiled by the author based on SOCAR's 2020-2022 annual report materials.

4. Ensuring the flow of new Western techniques and technologies to Azerbaijan;

We believe that all this allowed Azerbaijan to become a new international center for the development and export of natural hydrocarbons in the region, to take a key position in the Black Sea-Caspian basin, and most importantly, to create a magnificent East-West energy corridor.

Among the main indicators in the oil-gas and non-oil-gas sectors, which are of scientific importance for the dissertation, as well as the relationship between the human development index and the income obtained from the sale of oil and gas, statistical data were investigated using econometric methods and 3 econometric models were built.

The first model determines the econometric relationship between the revenues obtained from the trading of products in oil and gas sector and the volume of investments directed to the non-oil sector. The feature of the model is as follows:

$$LOG(QNSI\_MLM) = C(1) + C(2)*LOG(NQSG\_MLM) + [AR(1)=C(3), UNCOND, ESTSMPL="1995\ 2022"] \quad (1.1)$$

After evaluating the coefficients of the equation, it becomes fixed as follows:

$$LOG(QNSI\_MLM) = 1.2732565685 + 0.691435857753*LOG(NQSG\_MLM) + [AR(1)=0.729190595801, UNCOND, ESTSMPL="1995\ 2022"] \quad (1.2)$$

The LOG function in these regression equations is the natural logarithm, AR(k) is the k-form autocorrelation of the residuals, C(i) is the i-th coefficient, and ESTSMPL is the time range of the years considered for the indicators, investments directed to the non-oil sector of QNSİ (in million AZN), NQSG shows the income from the sale of oil and gas (in million AZN). Note that the coefficient of the explanatory variable in the models with log functional form indicates the elasticity coefficient. 89.39% of the change in investments directed to the non-oil sector was conditioned by the change in the volume of product sales in the oil-gas sector (because Adjusted R-squared=0.893896).

To ensure the adequacy of the established model, it is necessary to satisfy the conditions called Gauss-Markov conditions. These

conditions; a) linear according to model parameters; b) the balances of the measured indicator are dependent on each other; c) the residuals should be distributed according to the normal law (at least according to the asymptotic normal law); d) the variation of the residuals must be equal to a constant number, that is, homoscedastic; e) the residual order must be stationary. It is confirmed in the econometric theory that the established model is adequate when these conditions are met.

In the second model, the dependence of the main funds in the non-oil sector on investments in the non-oil sector is investigated. Features of the model are as follows:

LOG(QNS_EF_MLM) = C(1) + C(2)*LOG(QNSI_MLM(-4)) + [AR(6)=C(3),UNCOND,ESTSMPL="2000 2022"] (2.1)

The coefficients of this regression equation are specified as follows:

LOG(QNS_EF_MLM) = 6.47467481438 + 0.573507703506*LOG(QNSI_MLM(-4)) + [AR(6)=-0.784171855507,UNCOND,ESTSMPL="2000 2022"] (2.2)

It is clear that the transfer of investments to the main funds is not instantaneous but occurs gradually over a certain period of time. It should also be noted that the found coefficient is statistically essential at the 0.01% significance level. Appropriate tests were performed to show the adequacy of the established model.

In the last 3rd econometric model, the effect of income from product sales in the oil and gas sector on the human development index is studied. Features of the model are as follows:

HDI = C(1) + C(2)*LOG(NQSG_MLM) + [AR(1)=C(3), UNCOND, ESTSMPL="1995 2020"] (3.1.)

From the content of the model, it can be seen that the regression equation is linear in terms of coefficients, that is, the first of the Gauss-Markov conditions is satisfied. The model was realized and the coefficients of the regression equation were found and specified as follows:

HDI = 0.447180109392 +
0.0267397024478*LOG(NQSG_MLM) + [AR(1)=0.971350414309,
UNCOND, ESTSMPL="1995 2020"] (3.2)

Note that in level-log functional form models, the product of the coefficient of the dependent variable by 100 indicates the elasticity coefficient. Here it is calculated as 100*0.026740%≈2.67%. 98.32% of the change in the HDI indicator is determined by the change in the volume of income from the trading of products in the oil and gas sector. It was determined through the necessary tests that the established model 3 was also adequate.

Thus, each model constructed was implemented in the Eviews econometric application software package. As a result, the econometric analysis of the official statistical data of the State Statistics Committee and SOCAR for the years 1995-2022 was carried out and the following results were obtained:

1) 1% increase in the income from the trading of products in the oil and gas sector caused the volume of investments directed to the non-oil sector to increase by an average of 0.69% every year for the considered years;

2) A 1% increase in the volume of investments directed in the non-oil sector increased the volume of basic funds in the non-oil sector by 0.57% annually on average for the years under review with a 4-year delay;

3) When the revenues obtained from the trading of products in the oil and gas sector increased by 1%, the human development index for Azerbaijan increased by 2.67% on average every year for the considered years.

In the third chapter called **"The principle directions of the implementation of the new oil and gas strategy of Azerbaijan in the state of globalization"**, studies were carried out on the development of the long-term strategy of the development of the oil and gas industry in the conditions of new global challenges and deepening integration relations and within the framework of the possibilities of effective use of resources.

On the basis of the research, principal proposals reflecting the classification of the mechanisms and ensuring the strategic goals of

the upstream and midstream, which are the areas of activity of SOCAR, were prepared, and the classification characteristics of the internal economic development mechanisms that take into account the unique characteristics of the oil and gas industry are introduced. Here, as a logical conclusion of the research conducted in the previous chapters, new alliances-digitalization directions in the oil and gas industry of Azerbaijan in the conditions of globalization, justification of the application of the effective operator model in internal operations, and new models of the main directions of the long-term strategic development of the oil and gas industry in the context of the global industry have been developed and relevant results has been obtained. In this regard, in this chapter, a complex system of measures that ensures the strategic development of SOCAR in the long term is proposed (Diagram 1).

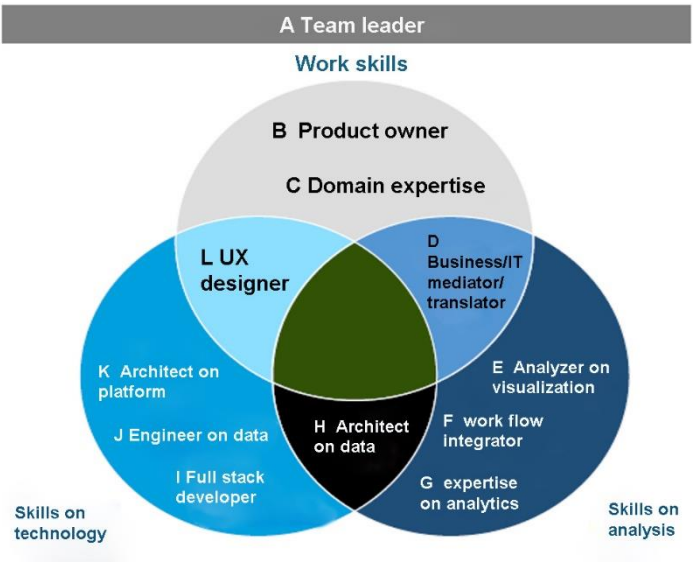


Diagram 1. Agile development environment

Source: The chart was developed by the author based on SOCAR's annual Sustainable Development reports

All successful digital transformation initiatives rely on similar foundational supporting measures. These measures can be classified

under 3 main characteristics – strategy, skills and operating model change. Initially, a strategic road map should be prepared, within the framework of which measures such as organizational agreement, activity prioritization, etc. should be implemented. We think that SOCAR's digital transformation goals can be achieved with a 3-stage road map.

This transformation can be done in six categories – strategic roadmap, human resources, agile model, technology, data, adoption and scaling. At present, large and small fields, offshore and onshore fields are managed by different OGPDs, but from one center, by "Azneft" PU. There is a need to change the management model of "Azneft" PU, taking into account the latest management trends in the oil and gas industry (functional restructuring, flexibility, etc.) and especially the realities revealed by the latest global threats.

In our opinion, some changes can be made to the current operating system of "Azneft" PU by dividing the fields, which are very different from each other in terms of size and production volume, into two groups. Thus, it is appropriate to separate low-yielding fields from "Azneft" PU and establish two separate business units such as low-yielding fields ("matured and marginal") and large and profitable fields ("Yeni Azneft"). Thanks to this, it is possible to ensure that each unit has a separate profit and loss report, operating model and transparent activity, and by giving them a unique approach, efforts can be made to obtain the maximum possible value from the fields.

As a whole, it is possible to group the reservoirs according to 3 characteristics: production, profitability and number of employees. It is possible to place the deposits on the matrix according to the high or low production and profitability. With a similar approach, the matrix of the grouping of the fields of "Azneft" PU by taking appropriate measures for each group of fields can be described as follows (Figure 1):

The study shows that keeping profitable fields under "Yeni Azneft" and implementing measures to increase production can lead to further improvement of the indicators of those fields. On the management of marginal reservoirs, it would be appropriate to cooperate with experienced companies through service agreements.

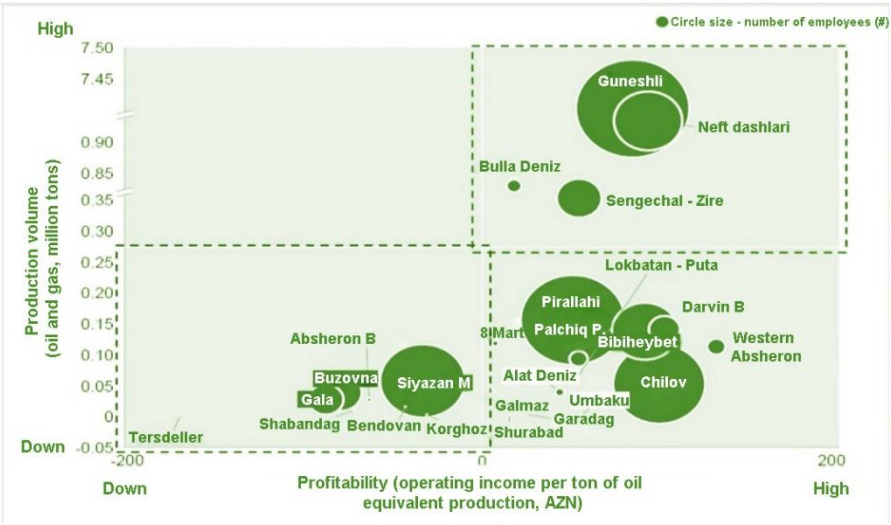


Figure 1. Matrix of grouping of fields of "Azneft" PU by categories

Source: The matrix was developed by the author based on SOCAR's Sustainable Development reports.

As is known, SOCAR's oil fields are mostly in the final stage of development. Studies show that if new resources are not added, the expected oil production from the fields currently in operation will decrease in the coming years.

When proposing SOCAR's Corporate Strategy in the last paragraph of the chapter, we think that special attention should be paid to its conceptual structure. For this, it is necessary to draw up an appropriate strategic hierarchy. Within the framework of the Corporate Strategy, 8 strategic goals and 19 priorities can be defined within these goals.

In our opinion, we can show the priorities of the strategic development of the oil and gas industry in the form of a table based on the programs developed for the near future development of the fuel-energy complex in the highest management structures in the republic (Table 3).

Table 3.

The main priorities of the strategic development of Azerbaijan's oil and gas industry

Key strategic objectives	Classification of main priorities
Monetization of hydrocarbons and ensuring Azerbaijan's energy security through geological exploration and increasing production	▪ Providing additional production volumes in the context of new oil and gas projects; ▪ Achieving stable maintenance of production in fields under long-term development on condition that economic efficiency is also increased; ▪ Increasing operational efficiency and develop operator skills.
Increasing the profitability of transportation and marketing of hydrocarbons	▪ Increasing operational efficiency and develop operator skills for transportation of hydrocarbons; ▪ Maximizing the use of the capacity of international pipelines and increasing the income from transit transportation; ▪ Expanding trading operations and increase profitability.
Improvement of activity in oil and gas processing and chemical industry	▪ Satisfying domestic demand for high-quality oil refining products; ▪ Increasing efficiency and profitability of chemical industry assets; ▪ Strengthening integration and operational excellence in the operations of processing and chemical enterprises.
Applying digitization across value chain segments and supporting innovation activities	▪ Achieving digital transformation and applying innovative technologies in all spheres of activity; ▪ Developing by acquiring a position on innovations (startups) that have high growth potential and providing stable financial returns.
Organization and development of activity on the transition to new energy sources	▪ Ensuring business stability during energy transition realization scenarios; ▪ Contributing to energy security through the development of new types of energy;
Strengthening the efficiency of commercial activities in local, regional and international markets and optimizing the business portfolio	▪ Increase commercial efficiency in oil and gas services business, retail fuel sales, gas distribution, trading, etc. in local, regional and international markets in order to achieve an increase in total profitability throughout the value chain; ▪ In order to optimize the business portfolio and ensure financial needs, regularly assess the potential of exiting business areas with low future growth potential or high sales price.

Follow-up to Table 3

Enhancing operational integrity and excellence	▪ Achieving operational excellence in activities across value chain segments; ▪ Ensuring integrity and synergy opportunities across portfolio assets.
Strengthening activities in the areas of human capital development, health, occupational safety and environment	▪ Carry out training and development, scholarship programs, health, safety and social responsibility obligations and measures in a sustainable manner; ▪ To become a leading organization in protecting the environment for future generations.

Source:The table is classified by the author for the long-term strategic goals and their priorities based on the data of SOCAR's Sustainable Development Report for 2015-2022

The long-term strategic steps of oil and gas companies can be considered important, carried out in the following 3 main directions: 1) accelerating the monetization of resources, 2) reshaping the portfolio, 3) expanding the scope of the portfolio from traditional hydrocarbons to new energy resources.

OUTCOME

A comprehensive study of the role and importance of Azerbaijan's oil and gas industry in the economic development of the country made it possible to obtain the following scientifically based results and to prepare proposals and recommendations:

1. The set of measures to ensure economic progress and the corresponding strategy of action, the essence of global economic development and the factors that determine it are reviewed, the important theoretical models of the development of the oil and gas industry and their distinguishing features are studied, and the world oil and gas industry of Azerbaijan in the conditions of globalization is investigated, its role in development is determined, the main characteristic features of modern globalization and economic development are elaborated.

2. When analyzing Azerbaijan's oil and gas industry, as well as its international relations in this field, the following economic

development factors are taken into account: the process of globalization of the world economy; constant growth of energy consumption in the world; rapid growth of world population; active growth of energy consumption in developing countries, future decrease due to increased efficiency of energy use in developed countries; gradual development of production technologies of unconventional hydrocarbon resources; volatility of energy prices; increasing environmental requirements for the use of fossil fuels.

3. As a result of the assessment of the impact of the income from oil and gas production on the non-oil and gas sector of the country based on a mathematical-statistical model, it was determined that the strategic goal to ensure the economic development of the country is to develop the non-oil sector at the expense of the oil and gas factor. As a result of our econometric analysis, it was determined that:

• 1% increase in income from product sales, the volume of investments in the non-oil sector increases by 0.69% on average every year;

• A 1% increase in the volume of investments in the non-oil sector, leads to an average annual increase of 0.57% in the volume of basic funds;

• A 1% increase in product sales, can increase the human development index by an average of 2.67% annually.

4. In the new economic conditions, proposals have been prepared for increasing the competitiveness of Azerbaijan's oil and gas industry in the world energy resources market, principal schemes reflecting directions of oil and gas industry management, classification of strategic goals and mechanisms, differing in content, have been given.

5. Ensuring the energy security of European countries by effectively using the potential opportunities of oil and gas export pipelines can contribute to the preservation of Azerbaijan's international influence and the sustainability of the country's economic development due to the oil and gas factor. In this regard, priority directions have been determined in order to increase the efficiency of the oil and gas sector in the world energy market.

6. It is considered that the mechanism for ensuring the development of enterprises related to the oil and gas recovery

industry should be based on the global information environment and modern digitalization should be widely used in all managing and managed systems. In our opinion, digitalization should be reflected at all phases, from exploration to the trading of oil. For this purpose, the main schemes of that mechanism are proposed in the work.

7. SOCAR's digitalization concept will be important in the near future to increase the oil production rate, to modernize SOCAR's upstream activity within the scope of innovation adoption and operational model change. As a result, SOCAR can become a leading digital National Oil Company, a high-level modern and sustainable company based on Digital Technologies and analytical thinking, thereby supporting the digitization of the industry in the country.

8. In our opinion, in order to maintain the level of production in the larger and more profitable fields of "Azneft" PU ("Yeni Azneft"), the measures for the re-development of the fields and the production increase can be divided into two categories. To the first category, measures such as increasing production by methods like efficient well management, improving the oil recovery coefficient, and finding out the exploration potential of fields in operation can be applied, and to the second category, measures such as increasing the usefulness of geological measures and maintaining production efficiency can be applied.

9. We believe that SOCAR will improve its capabilities both in the fields where it is a direct operator and by using the opportunities of the joint operator model and will increase the role of the operator for future projects using various options. For SOCAR, Eastern Europe, Caspian, Middle East and North African countries can be alternatives for long-term expansion in upstream. As a result, Azerbaijan should be the main focus of SOCAR's upstream activities in the future, and access to international markets should also be considered. For this, SOCAR can start as a non-operator shareholder in the operational fields. Later, in the long-term, SOCAR may consider becoming an operator as well, gradually developing the skills of redevelopment of existing fields and other specialized skills.

10. Our research proves once again that the implementation of the strategic goals set by the state of Azerbaijan regarding the transportation

of oil and gas will contribute to the increase of our country's reputation in the international world and the provision of energy security.

11. In order to shape the development of SOCAR until 2030, analyzes were conducted taking into account the market context and current situation in the upstream and midstream areas of activity, and the following proposals were determined:

- Accelerate the search and exploration of reserves, financing of the project;
- Apply an efficient operating model in internal upstream operations;
- Expand SOCAR's upstream operating capabilities and role;
- Test access to regional and, if possible, world markets based on a long-term option;
- Strengthen the digitization process in all groups;
- Increase midstream operational efficiency;
- Ensure monetization of midstream assets through long-term financing mechanisms;
- Improve the corporate management system;
- Optimize the organizational structure based on best practices.

Main content of dissertation reflected in the following works:

1. Huseynov A.G., Huseynov E.A., Ways to improve innovative activities in oil and gas production enterprises //SOCAR Proceedings Special Issue (Scopus), 2021, No. 4, pp.1-7

2. Huseynov A., Samusevych Y., Huseynov E., Innovative development of oil & qas industry: role of environmental taxation, // Journal Marketing and Managment of İnnovations (WOS), Ukraine, 2021,№4, pp.79-91.

3. Huseynov E.A., Innovative development trends in the oil and gas industry, // Scientific-practical magazine of construction economics and management, Baku, 2002, No. 1, pp. 70-76.

4. Huseynov E.A., Taghiyev A.A., Economic effect of foreign direct investment in the oil and gas sector of Azerbaijan // SOCAR Proceedings Special Issue (SCOPUS), 2023, No. 1, pp. 6-11.

5. Huseynov E.A., The role of investment in innovative personnel policy in the conditions of globalization // Azerbaijan Oil Industry Journal, Baku, 2023, No. 9, pp. 38-42.

6. Huseynov E.A., "Oil and gas strategy" of Azerbaijan and realities: Oil and gas revenues are a guarantee for restoration and construction works in the territories liberated from occupation.// Az MIU, conference materials dedicated to the 100th anniversary of H.Aliyev. Baku, 2023, pp. 441-444.

7. Huseynov E.A., “Characteristics of modern globalization // XV international scientific and practical conference of young scientists and educators” Current problems and perspectives of the development of accounting, analysis and control in the globalization of the economy, Lutsk, Ukraine, 2023, pp.12-15

8. Huseynov E.A., Digitization in oil and gas companies in the industrial context //International scientific and practical conference "Modern management and socio-economic aspects of the development of the state, regions and subjects management in conditions of transformation public administration", Odessa, Ukraine, 2023, pp.211-213.

9. Huseynov E.A., Optimizing directions of digitization in the oil and gas industry of Azerbaijan // "Sustainable development" dedicated to the 100th anniversary of H.Aliyev, held under the Joint Organization of the Accounting Chamber of the Republic of Azerbaijan and the Chamber of Auditors. International scientific-practical conference on "Accountability, Transparency", Baku, Azerbaijan, 2023, pp. 334-336.

10. Huseynov E.A., Aspects of the application of the effective operator model in internal operations // ENECO scientific journal, News of the Energy Economy Center, Baku, 2023, No. 4, pp. 24-29.

11. Huseynov E.A., New perspectives on the development of Azerbaijan's oil and gas industry // Azerbaijan Cooperation University, Cooperative scientific and practical journal, Baku, 2023, No. 4, pp. 173-181

The defense of the dissertation will be held on February 28, 2024 at 16^{00} at the meeting of the Joint Dissertation Council ED 2.46 of Azerbaijan Cooperation University and Baku Business University attached to Supreme Attestation Commission under the President of the Republic of Azerbaijan, and operating at Azerbaijan Cooperation University

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