**UDC 330** 

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# SECURITY OF THE GAS MARKET OF UKRAINE AND FEATURES OF ITS IMPLEMENTATION

The ways of implementing the main principles of functioning of the gas market in Ukraine according to the European scenario are outlined. It was determined that Ukraine currently applies the following systems of cooperation with the European Association of Gas Transmission System Operators of the EU – ENTSO-G, as well as the European Association of Electric Network Operators of the EU – ENTSO–S. The challenges facing the gas industry have been clarified, including: gas distribution and gas supply companies have mainly carried out a formal separation of spheres of activity, remaining in fact the property of the same shareholders and vertically integrated enterprises; preferential pricing of natural gas for specific categories of consumers (population, heat supply companies, religious organizations) in combination with a special regime of guaranteed supply creates prerequisites for the accumulation of debts and manipulations at the level of gas distribution and gas supply companies; the incompleteness of the process of establishing gas accounting systems and the existence of regulatory volumes of consumption leaves opportunities for manipulations and abuses and the formation of debts between market participants, primarily gas distribution companies to the operator; the global drop in natural gas prices is one of the reasons that stand in the way of increasing domestic production and, accordingly, reducing dependence on imports; there is still a threat of stopping the transit of Russian gas through the territory of Ukraine after the expiration of the current five-year contract between Russia's Gazprom and Naftogaz of Ukraine, which will bring significant changes to the operation of the gas transportation system. The structure of the gas sector, which covers the management of the corporation Naftogaz of Ukraine, is structurally combined with the state gas production company JSC "Ukrgazvydobuvannya" and the operator of gas storage facilities, has been studied. Several criteria have been identified that will contribute to ensuring the appropriate level of security of the natural gas market in Ukraine, among which we can highlight the following: the low purchasing power of consumers. Unfortunately, the war caused several crises, which were consequently accompanied by the growth rate of prices and tariffs for energy resources. The decline in the general well-being of citizens generates enormous social consequences for Ukraine; the direction of increasing own production of natural gas in Ukraine is provided for in the Energy Strategy of Ukraine for the period up to 2030. The basis in this direction should be an exploration for finding and extracting shale gas deposits. It should be noted that the oil and gas industry is characterized by several differences, primarily in the analysis and evaluation of the effectiveness of investment projects. The systematic use of the energy security criteria of the oil and gas segment will provide an opportunity for the subjects of these market structures to dynamize the relevant components to obtain an energy effect, with the subsequent activation of mechanisms for adapting the entire system to new operating conditions. In summary, it should be noted that a plan is understood as a certain number of interconnected elements that interact with each other and form the integrity and practicality of their existence in terms of synergy. The application of systematicity allows solving the problem of long-term strategy and sustainability of energy security with the possibility of consistency of goals, balanced energy policy, and institutional transformation of the system. The synergy of the system will take place under the condition of adequate assessment of the main components for their functional purpose. The use of the systemic method involves a description of possible changes in the structure of the energy sector system of Ukraine, namely: a gradual change in the ownership of energy sector assets, an increase in the share of the private sector in the functioning of the country's energy sector.

**Keywords:** gas market, features of the gas market of Ukraine, gas market security, natural gas market, stability of the natural gas market.

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## 1. INTRODUCTION

In Ukraine, the fuel market operates within the framework of the Law of Ukraine: "On the Natural Gas Market" dated April 9, 2015, which introduced the main principles of European legislation and initiated a series of radical changes in the gas industry [3, 4, 8, 9].

Implementing the main principles of gas market functioning according to the European scenario, Ukraine has taken the following steps:

- vertically integrated companies are divided according to their spheres of activity production, transportation, distribution, and supply. As a result, regional distribution and supplier companies were branched out. As a result of corporatization processes, the state oil and gas company NJSC "Naftogaz of Ukraine" was separated from its structure by the company operator of main gas pipelines of Ukraine;
- free and non-discriminatory access to gas transportation and gas distribution networks, tariff formation according to the "input-output" method, and relevant points of commercialization of gas accounting were initiated;
- exchange auctions for natural gas trading, which allow concluding contracts at the market price and forming the stability of competitive foundations between suppliers, received adequate coverage;
- rapid diversification of the import of energy resources between Ukrainian and foreign companies took place in 2020. However, the strength of these reverse processes weakened in connection with the war, increasing the problem of scarcity of energy resources;
- coordination of partnership efforts between the operator of the gas transportation system on a contractual basis with the majority of partner companies of neighboring European countries regarding the so-called "virtual reverse." The use of "virtual reverse" will reduce the cost of importing gas to Ukraine and allows specific volumes to be moved without physical movement across the western border of Ukraine;
- use of the "customs warehouse" service by the operator of the gas transportation system. The primary function of this service is the reservation

and further storage of gas by European companies. This, before the military operations, attached to Ukraine important and strategic importance in the perspective of creating a regional gas hub as part of the European gas market;

Ukraine currently applies the following systems of cooperation with the European Association of Gas Transmission System Operators of the EU – ENTSO–G, as well as the European Association of Electric Network Operators of the EU – ENTSO–S.

# 2. ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

A large number of studies at both the theoretical and practical levels were devoted to studying issues related to Ukraine's energy sector.

In a certain way, the vast majority of them reveal the main provisions that have already been highlighted in the Ukrainian Energy Strategy. Among the research scientists in this field, it is worth noting: M. Korotya, V. Lagodienko, R. Romanyuk, etc. [6, 11, 13, 14, 17, 19-23].

Among the scientists who support the opinion regarding the consolidation and socialization of the regulatory and legal basis of the energy sphere of the state, it is worth highlighting S. Galyant, V. Kupchak, O. Novosad, K. Pavlov, O. Pavlova, O. Strishenets and others [6, 17-24].

# 3. FORMULATION OF THE OBJECTIVES OF THE ARTICLE

The purpose of this article is a comprehensive study of the peculiarities of the system of implementation of the security of the gas market of Ukraine.

# 4. PRESENTATION OF THE MAIN MATERIAL OF THE RESEARCH WITH FULL JUSTIFICATION OF THE OBTAINED SCIENTIFIC RESULTS

Challenges facing the gas industry:

- gas distribution and gas supply companies mainly carried out a formal separation of spheres of activity, remaining, in fact, the property of the same shareholders and vertically integrated enterprises;

- preferential pricing of natural gas for specific categories of consumers (population, heat supply companies, religious organizations) in combination with a special regime of guaranteed supply creates prerequisites for the accumulation of debts and manipulations at the level of gas distribution and gas supply companies;
- the incompleteness of the process of establishing gas accounting systems and the existence of regulatory volumes of consumption leaves opportunities for manipulations and abuses and the formation of debts between market participants, primarily gas distribution companies to the operator;
- the global drop in natural gas prices is one of the reasons that stand in the way of increasing domestic production and, accordingly, reducing dependence on imports;
- there is still a threat of stopping the transit of Russian gas through the territory of Ukraine after the expiration of the current five-year contract between the Russian Gazprom and Naftogaz of Ukraine, which will bring significant changes to the operation of the gas transportation system.

The sources of the supply of blue fuel to the unified gas transportation system of Ukraine are domestic production, imports from EU countries, and the availability of reserved stocks in storage facilities. Therefore, understanding the security of energy security is related to compliance with specific criteria. The first is the neutralization of obstacles related to the termination or scarcity of the gas resource supply, with the subsequent provision of the supply of this strategic resource necessary for the market [1].

The structure of the gas sector includes the management of the corporation Naftogaz of Ukraine, which is structurally combined with the state gas production company JSC Ukrgazvydobuvannya and the operator of gas storage facilities.

should noted that **JSC** be "Ukrgazvydobuvannya" concentrates 67% of the total domestic production, which calls into question the mechanism of transparent pricing on the gas market. In order to ensure objective market conditions for the functioning of the gas sector, all market participants should be given free access to the resources of **JSC** 

"Ukrgazvydobuvannya." This is the second criterion related to the security of competing mechanisms and the formation of a favorable market environment.

The following criterion for the safety of the gas market is the transparency of the activities of the National Commission for the Regulation of Energy and Utilities. In this sense, it is necessary to consider the financial dependence of the operator of the gas transportation system of Ukraine on OJSC Naftogaz of Ukraine, the formation of risks for the non-discriminatory functioning of the natural gas market, and objective tariff formation.

An unsolved problem is still the accumulation of indebtedness, limitation of financial liquidity, and impoverishment in the market of heat-generating enterprises [6].

"Particularly acute is the fact that discriminatory conditions are being created for the financial and economic activity of the thermal utilities, which in the heating season next year will buy gas already at the market price," experts from the Razumkov Center believe. Therefore, this threat can cause a stoppage in the heat supply.

The fourth safety criterion in the gas market is the low purchasing power of consumers. Unfortunately, the war caused several crises, which were consequently accompanied by the growth rate of prices and tariffs for energy resources. The decline in the general well-being of citizens generates significant social consequences for Ukraine [10].

Even though the National Commission has representative offices in almost all regions of the country, there is no corresponding information support for consumers. This is connected with the press service employees' low competence level and unjustified national energy and utility regulation commission politicization.

Therefore, there was a need to apply new forms of organization of relationships between essential components of innovative development: production, educational and scientific space, and information. In this area, the gas sphere has only recently started implementing educational, scientific, and informational cooperation between institutional objects and market subjects. The interdependence between low education, the level of competence of the personnel potential of the gas sector, and misinformation and low productivity is evident and proven.

The sixth criterion focuses on increasing Ukraine's production of natural gas, provided for in

the Energy Strategy of Ukraine for the period up to 2030. The basis in this direction should be an exploration for finding and extracting shale gas deposits [3].

It should not be forgotten that Ukraine has a significant potential for extracting natural gas from shale rocks [2, 5, 7, 16].

On February 24, 2022, with the beginning of a full-scale invasion of the territory of our country by the Russian invaders, the situation on the fuel market reacted instantly. The loss of imports of petroleum products resulted from the cessation of supplies from Belarus, Russia, and by sea. A particular difficulty should be noted in March, April, and May; however, Ukraine was able to resist thanks to the continuous work of the Kremenchuk Oil Refinery Complex, which remained the only working oil refinery after the shutdown of the Shebelinsky Gas Refinery.

The state was forced to make balanced and necessary decisions at the moment. First, this concerned the limitation of taxes and excise on fuel and oil products since fuel should be an affordable option for the population, the military, and entrepreneurs. Subsequently, the process of reformatting the logistic ways of supplying fuel and petroleum products took place and is still ongoing. Then there was the restoration of fuel supply, but mainly attracting European traders.

The fuel situation at gas stations has worsened since the last week of April and continues to this day. At the same time, the largest gas stations limited the sale of fuel to 10-15 liters; this is for regular customers and owners of loyalty cards; for ordinary consumers, the fuel limit was even more significant, from 10 to 5 liters, which was the cause of the commotion.

This is due to the following circumstances:

- by increasing the marginal prices for fuel and diesel fuel by 40-43%.

Considering the marginal allowances of trade mark-ups, the maximum price should reach 37.69 per liter of fuel and 42.63 per liter of ordinary diesel fuel. However, not all market participants adhere to this.

- it is not possible to deliver the purchased barrels of oil from Europe at this time due to the war and traffic jams at the ports of Eastern Europe.
- violation of logistics and neutralization of infrastructure connections.

Here it should be noted that the transportation of fuel and oil products is carried out through the Western border from European ports. The lack of functionality of the Kremenchuk Oil Refinery essentially minimized the logistical supply of fuel to central and eastern Ukraine. Also, the destroyed infrastructure significantly increased the logistical costs of fuel delivery and its final price.

However, solving the fuel shortage problem is not only in the interests of Ukraine but also of many countries since our country is a massive supplier of agricultural products, and the lack of exports or disruptions in them will have a critical and negative impact on the global product market.

Prime Minister Denys Shmyhal is convinced that there is plenty of fuel and diesel. The country has a strategy for exiting the crisis and will strengthen state regulation of the fuel market.

At the same time, today, the volume of fuel imports into Ukraine corresponds to the daily consumption rate of this strategic resource. Today, fuel imports have increased five times compared to the beginning of April. A separate item is a plan for reserving fuel and oil products. This strategic stockpile cannot be bombed or destroyed. This will make it possible to provide the country with a strategic resource for several months, provided the escalation continues.

Imported fuel to Ukraine is expected shortly from Poland, Lithuania, Germany, Romania, the USA, the Netherlands, and Belgium.

First of all, it should be noted what the fuel cost depends on. Two main components should be mentioned here: world quotations for fuel and oil products and the exchange rate in the country. The devaluation of the national currency of Ukraine as a result of the war makes the price formation, not in our favor.

However, traders emphasize specific difficulties that cause delays in fuel delivery to Ukraine. First of all, it concerns the logistics of railway and transport routes. In particular, there is a shortage of tank cars, locomotives, gasoline trucks, etc. In order to speed up the processes of solving the mentioned problems, the possibility of creating green corridors for the transportation of fuel and simplifying the procedure for issuing permits is being considered.

State regulation of fuel prices is a huge problem. Investigating this problem, it is worth noting that in most developed countries of the world, the fuel market does not exist in its pure form. Each state applies its instruments, which are acceptable to the country's socio-economic situation, which affects the development of this economic sector. Almost all countries have institutions that regulate the level of prices in the country. They act based on antimonopoly

legislation and laws on price regulation of goods and services.

The fuel boom will continue until a system of supply stability and leveling of safe logistical support of this strategic resource to eastern and central Ukraine is established. This will be the impetus for the knowledge of the moratorium on limiting the volume of sales and will eventually stabilize prices. However, they will not be the same as before the war.

The main challenges and threats of the fuel and energy sector of Ukraine. It should be noted that the oil and gas industry is characterized by several differences, primarily in the analysis and evaluation of the effectiveness of investment projects. Specific features of the oil production industry distinguish it from other material production industries. These include: extremely high capital intensity of oil and gas production, which requires significant investments; interdependent and consistent process harmonizing the leading indicators and criteria for the effectiveness of investment projects based on natural and geological features, the degree of intensity and exploration of resource provision and available hydrocarbon reserves; high level of variability of natural and climatic factors, which are measured by technical and technological and financial and economic indicators of investment projects; the unpredictable nature of manifestation of most technical and economic indicators of the development of oil and gas fields; a considerable number of economically unjustified costs in relation to the volumes of explored reserves; long-term investment involvement in projects for the development and development of new oil and gas fields, individual deposits and exploitation facilities (more than ten and in some cases even fifty years); regressive growth of the reproductive structure due to the need to increase costs to compensate for the decrease in production volumes at deposits that are depleted or exhausted; as a rule, the innovative nature of investment projects aimed at the development of difficult-to-extract and depleted oil and gas fields requires significant amounts of capital investment and leads to the appearance of additional types of risk that are difficult to predict; creation and restoration of logistics infrastructure and safe locations of tanks [15].

These challenges create conditions that require a highly in-depth assessment of the effectiveness of regulatory processes in the oil and gas industry and thorough research.

Ensuring the appropriate level of energy security in the oil industry of Ukraine is possible if the following criteria are met:

- the creation of green corridors for fuel transportation and simplifying the procedure for issuing permits for unloading points of the international movement of fuel and petroleum products.
- to form our strategic reserves of fuel and oil products to increase our energy security and increase the economic stability of the army and the population during military operations;
- intensification of ENTSO-G processes and ENTSO-S with the further provision to consider the possibility of offsetting the electrification of Europe and more favorable terms of oil supply and implementation of the corresponding strategy and adoption of the state program for the electrification of the transport and logistics industry.
- the creation of a particular energy zone of the fuel and energy industry, where it is planned to apply a unique system of benefits and incentives for enterprises, resulting in further coordination of efforts with foreign partners. Under the conditions of recovery and recovery of the country's fuel and energy industry after the war, the main goals of such collaboration will be: economic, social, and technological.
- substantiation of the number of rent payments depending on the oil production fields, based on the determination of the reservoir properties of the formations and the depth of the productive components;
- increasing the energy efficiency of the oil refining complex of Ukraine through the energy conservation policy and ensuring, on its basis, the economic efficiency of oil and gas extraction and processing based on the enterprise's energy audit;
- strengthening state regulation of system taxation enterprises in the oil production industry.

The systematic use of the energy security criteria of the oil and gas segment will provide an opportunity for the subjects of these market structures to dynamize the relevant components to obtain an energy effect, with the subsequent activation of mechanisms for adapting the entire system to new operating conditions.

In summary, it should be noted that a system is understood as a certain number of interconnected elements that interact with each

other and form the integrity and expediency of their existence in terms of synergy.

Let us talk about the systematic nature of the oil and gas industry. We present energy security in the following graphic form through the interaction of elements, the structure of connections, and institutional objects.

5. CONCLUSIONS FROM THIS STUDY AND PROSPECTS FOR FURTHER INVESTIGATION IN THIS DIRECTION The application of systematicity allows solving the problem of long-term strategy and

sustainability of energy security with the possibility of consistency of goals, balanced energy policy, and institutional transformation of the system. The synergy of the system will take place under the condition of adequate assessment of the main components for their functional purpose. The use of the systemic method involves a description of possible changes in the structure of the energy sector system of Ukraine, namely: a gradual change in the ownership of energy sector assets, an increase in the share of the private sector in the functioning of the country's energy sector.

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#### Анотація

## МАТІЙЧУК Любомир Павлович. Безпеки газового ринку України та особливості її реалізації

Окреслено шляхи імплементації основних засад функціонування ринку газу Україною за європейським сценарієм. Визначено, що Україна на разі застосовує такі системи співпраці з  $\epsilon$ вропейською асоціацією операторів газотранспортних систем  $\epsilon C - ENTSO-G$ , а також  $\epsilon$ вропейською асоціацією операторів електричних мереж ЄС- ENTSO-S. З'ясовано виклики, що стоять перед газовою галуззю, серед яких: газорозподільчі і газопостачальні компанії переважно провели формальне розділення сфер діяльності, залишившись фактично власністю тих самих акціонерів і вертикально інтегрованими підприємствами; пільгове ціноутворення на природний газ для окремих категорій споживачів (населення, теплопостачальні компанії, релігійні організації) у поєднанні із спеціальним режимом гарантованого постачання створює передумови для накопичення боргів та маніпуляцій на рівні газорозподільчих і газопостачальних компаній; незавершеність процесу встановлення систем обліку газу та існування нормативних обсягів споживання залишає можливості для маніпуляцій і зловживань і формування заборгованості між учасниками ринку, перш за все газорозподільчих компаній перед оператором; глобальне падіння цін на природний газ є однією з причин, які стоять на перешкоді нарощуванню вітчизняного видобутку та відповідно, зменшення залежності від імпорту; зберігається загроза припинення транзиту російського газу через територію України після завершення терміну дії чинного п'ятирічного контракту між російським «Газпромом» і НАК «Нафтогаз України», що внесе суттєві зміни у режим роботи газотранспортної системи. Досліджено структуру газової сфери, що охоплює управління корпорацією HAK "Нафтогаз України" яка структурно  $\epsilon$  по $\epsilon$ днаною з державною газовидобувною компанією АТ "Укргазвидобування " та оператором газосховищ. Виділено ряд критеріїв, що сприятимуть забезпеченню належного рівня безпеки ринку природного газу в Україні, серед яких виділимо наступні: низька купівельна спроможність споживачів. На жаль, війна спричинила ряд криз, які наслідково супроводжуються темпами зростання цін і тарифів на енергоресурси. Падіння загального добробуту громадян породжує великі та соціальні наслідки для України; напрям збільшення власного видобутку обсягів природного газу в Україні, передбачених у Енергетичній стратегії України на період до 2030 року. Основу в цьому напрямі має скласти розвідка щодо знаходження та видобутку покладів сланцевого газу. Слід відмітити, що нафтогазовидобувна галузь характеризується рядом відмінностей, в перш чергу, що стосується аналізу й оцінки ефективності інвестиційних проєктів. Використання системності критеріїв енергетичної безпеки нафтогазового сегменту забезпечить можливість суб'єктами даних ринкових структур динамізувати відповідні складові задля отримання енергетичного ефекту з подальшим приведенням в дію механізмів адаптації усієї системи до нових умов функціонування. Узагальнюючи, слід відмітити, що під системою розуміється певна кількість взаємопов'язаних елементів, які взаємодіють між собою та утворюють цілісність та доцільність свого існування з огляду на синергію. Застосування системності дозволяє вирішити проблему стратегії довгостроковості та сталості енергетичної безпеки з можливістю узгодженості цілей, виваженої енергетичної політики, інституційної трансформації системи. Синергетичність системності відбуватиметься за умови адекватної оцінки основним компонентам на предмет їх функціонального призначення. Використання методу системності передбачає опис з можливих змін у структурі системи енергетичного сектору України, а саме: поетапної зміни права власності на активи енергетичного сектору, збільшення частки приватного сектору на функціонування енергетики країни.

**Ключові слова**: газовий ринок, особливості газового ринку України, безпека газового ринку, ринок природного газу, стабільність ринку природного газу.

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