

METHODOLOGY FOR ENSURING, REGULATING, AND MONITORING COMPLIANCE WITH THE APPROPRIATE LEVEL OF EFFICIENCY OF THE ENERGY SECURITY SYSTEM IN UKRAINE

Liubomur MATIICHUK¹, Olena PAVLOVA², Kostiantyn PAVLOV³

¹ Ternopil Ivan Puluj National Technical University
<https://orcid.org/0000-0001-6701-4683>

e-mail: mlpstat@gmail.com

² Lesya Ukrainka Volyn National University
<https://orcid.org/0000-0002-8696-5641>

e-mail: pavlova.olena@vnu.edu.ua

³ Lesya Ukrainka Volyn National University
<https://orcid.org/0000-0003-2583-9593>

e-mail: pavlovkv@icloud.com

The problem of "systematicity" of the criteria for the safety of the gas sector in Ukraine was considered, where it was necessary to substantiate and analyze the essential content of each of the clearly defined criteria in the structure of the systematicity and generality of the approach, which include: Regarding the first criterion of safety, which meaningfully concerns the issues of elimination obstacles and shortage of gas resources with further supply on the industry market - stimulation of the activities of subsurface developers; With regard to the 2nd criterion of compliance with energy security: ensuring free access by all participants of the gas market to the resource of JSC "Ukrgezvodobuvannya" and promoting compliance with competitive mechanisms - accumulation and activation of efforts to cooperate with foreign partners in the direction of the development of underground gas infrastructure; increasing gas production and drilling new wells by involving independent entities; formation of electronic auctions regarding the free access of entities that can conduct ge exploration work on drilling wells and other activities aimed at increasing gas production; The 3rd criterion for achieving the energy security of the gas sector in the direction of transparent regulation of the activity of the National Energy Regulatory Commission of Ukraine with further non-discriminatory functioning of the gas market and objective tariff formation is to introduce the informative system "electronic passport of the licensee" and the mobile application "Energy Online". The 4th criterion for the availability of energy security in the gas sector provides - strengthening the role of regulating the activities of gas market entities through monitoring, licensing, and control by the National Commission, which carries out state regulation in energy and communal services. 5th criterion: application of new forms of organization of relations between important components of innovative development of production, educational and scientific space, and information - development and implementation of the appropriate regulatory and legislative framework, which involves clarifying several conditions regarding the definition of directions, mechanisms, and tools of state support of the system partnership relations between scientific, educational and industrial (specialized) institutions; development of innovation-venture-type infrastructure by introducing the activities of network business incubators, innovation laboratories, etc., which are designed to combine the interests of academic, industry and university science, as well as on this basis, the everyday use of scientific, scientific-technical and educational-production competences. Criterion 6 provides for an increase in own production of natural gas, as well as exploration and production of gas. Considering question 7 of the criterion of the security of the gas sector, it should be noted that varying forms of the combination of state and market regulatory instruments are capable of restoring, to some extent, stable and safe gas supply - projects for the redesign of gas networks. Formation of an underground network of gas pipelines, their replacement from steel to polyethylene; systemic decentralization of the city's energy supply infrastructure; the concept of using alternative forms of gas resources and further gas reservation; application of an effective state system of energy management at enterprises in the gas sector; reduction of rent payments and simplification of the regulatory regime of gas production.

Keywords: efficiency of energy security, security system, energy security, methodical approaches, security level regulation.

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INTRODUCTION

It is no secret that the Russian war against Ukraine also caused significant losses in the country's gas sector. At the end of May 2022, "Regional Gas Company" estimated losses from Russian aggression about gas transportation and gas distribution networks in the amount of about UAH 9.9 billion. This applies to damage and failure of more than 5 thousand km. of gas distribution networks, disconnection, and neutralization of about 1,074 gas distribution and 2,739 cabinet gas regulating points. Moreover, the volume of losses will only increase in the future [10].

ANALYSIS OF MODERN FOREIGN AND DOMESTIC RESEARCH AND PUBLICATIONS

A large number of studies at both the theoretical and practical levels were devoted to the study of issues related to the regulation of the effectiveness of the functioning of the energy security system of Ukraine.

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, and others. [9, 19, 25, 26].

Among the scientists who support the opinion regarding the consolidation and socialization of the state's normative-legal basis in the energy sector, it is worth highlighting S. Galyant, V. Kupchak, O. Novosad, K. Pavlov, O. Pavlova, O. Strishenets, and others. [2, 3, 8, 13, 14, 17, 22-24, 29].

This article aims to conduct a multifaceted study of methodical approaches to regulating the effectiveness of the functioning of the energy security system in Ukraine.

COVERAGE OF THE PRIMARY MATERIAL

Preliminarily considering the problem of "systematicity" of gas safety criteria in Ukraine, it is worth justifying and analyzing the content of each of the clearly defined criteria in the structure of systematicity and generality of the approach.

The first safety criterion meaningfully relates to the issues of eliminating obstacles and shortages of gas resources with further supply on the industry market. It is worth outlining the following ways and tools for the strategic achievement of goals:

- stimulating the activity of subsurface developers. Despite the war, enterprises that implement underground mining in Ukraine work and pay taxes to speed up the processes of reproduction of the national economy and the need to fill the state and local budget levels. However, the issue of limiting the offer of using part of the subsoil is quite acute today. Since many subsurface developers in connection with the occupation of part of the Ukrainian territory by Russia have lost access to the northern, eastern, and southern regions, where the reserves of energy raw materials are mainly located, as well as the work related to their extraction is concentrated.

The products of the processing industry are also unfavorable for transportation to Ukraine due to the blocked operation of Ukrainian sea ports. It is no secret that the logistic connection of energy resources from European countries takes place mainly by land routes, which, unfortunately, are inherently more expensive, directly affecting the price of final products. These circumstances logically question the competitiveness of the national economy, which inevitably affects the bankruptcy of the domestic business system. Therefore, it is essential in this direction to consider the need to apply financial, tax, and economic directions.

Financial and tax instruments are designed to stimulate business under conditions of war, particularly in energy supply, as an integral component of any economic process. In particular, on the part of the state for the owners of underground wells and deposits, in connection with possible tax preferences, it was decided to increase the rent income of the users of underground plots. This, as a consequence, in turn, suppresses the business environment and further deepens the crisis of society.

In addition, one should also consider such a circumstance as the obsolescence of the wells themselves, the depletion of deposits due to irreversible changes in the land, and the declining nature of the return of natural resources. This means that the search for energy raw materials and the process of drilling old, already developed wells under their depletion is becoming more complicated. It is no secret that the longer the period of actual exploitation of the well, the deeper the necessary deposits can be found (as a rule, this indicator is from 5-6 km) and, of course, the extraction, processing, and supply process will be more expensive. Unfortunately, every third well can be like this today.

According to the data of the state web portal of the budget for citizens, during 2020-2021, revenues to the state budget from rent payments for the use of subsoils of national importance increased almost 20 times, to the local budget - by four times [6, 21]. As a result, last year, the state budget received only rent payments, about UAH 75.6 billion, 5.8% of the total revenue [21]. It is known that the tax rates of taxation for the extractive sectors of the economy are usually the result of such factors as the total volume of extraction, the market pricing mechanism, and the established policy of the tax burden (Fig. 1).

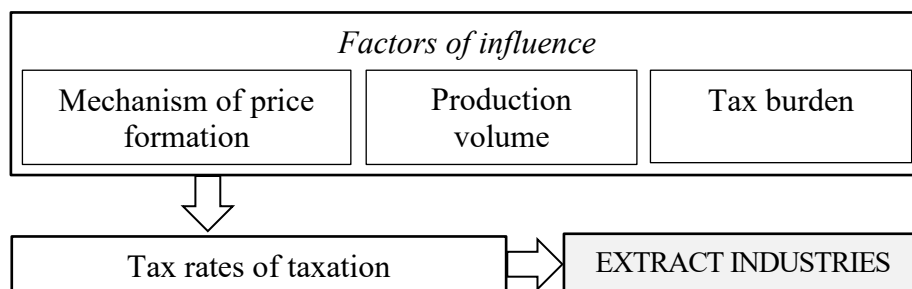


Fig. 1. Directions of the formation and influence of the tax rate on the functioning of extractive industries in Ukraine

Achieving the appropriate proportion between the mentioned factors will allow, first of all, to increase the number of revenues to local and state budgets permanently, which will become the basis for the recovery of the economy of Ukraine.

In the same sense, specific changes have already been made in part of the adoption of the Law of Ukraine No. 7038d, within which a differentiated rent was assigned for the use of subsoil under martial law conditions [11].

Within the framework of this legal document, the rate of differentiated annuity provides for the following scenarios: 1. If the price is below 150 US dollars, the tax rate is calculated as a ratio of 0.5 to the volume and price; 2. If the price is in the range of 150-400 US dollars, it is recommended to apply the current tax rates; 3. If the value exceeds 400 US dollars, regressive taxation is applied [5].

Therefore, based on the content of the above, we can conclude that a rather crucial step to achieving the required level of energy security will be reducing the tax burden for subsurface users of energy resources. Here we should point to the experience of the Netherlands, which implemented a complex energy policy, the "Small Fields Policy," which in its content is aimed at supporting work in small fields, where the ratio of rent rate and income tax reaches zero.

The next issue is the sale of extracted gas. Domestic gas production companies faced the mentioned problem because, as a result of the war, several facilities of the primary consumers of independent companies - industry, were destroyed. As a result, producers were forced to reduce gas production by 40-60%. From March 2022, a ban on the export of the specified energy resource until the end of 2022 officially entered into force, according to Cabinet Resolution No. 666 of June 10, 2022 [16].

At the moment, the mentioned problem is partially solved in connection with the adoption of the Law of Ukraine № 7249, which provides for the payment of rent after the sale of gas [1]. Also, within the limits of this document, producers are allowed to pump and store gas resources in underground storage and pay rent already after the sale of gas or within three months after the war's end.

A derivative of the indicated problem is the issue of the disproportionality of the cost of gas sales following the tax rate at which the rent payment is repaid. Rent for gas before the war was calculated from the value of import parity that is, from the average price of gas that should have been cleared. Even under war conditions, gas rent is calculated as a cumulative indicator based on average futures quotations on the European hub and import parity.

Therefore, a temporary imbalance arose, during which, under the conditions of Russian aggression, gas prices in Europe increased by more than half the value and reached 2,200-2,600 dollars. The USA for a thousand cubic meters, but at the same time, Ukraine sold this resource for only 700-800 dollars. The USA. Therefore, domestic gas production enterprises currently do not have funds to build new centers and wells, restore and renovate outdated material and technical funds, and explore new deposits.

Particular attention should be paid to the investments that should be made in the domestic gas transportation system, which until today has worked exclusively to ensure the transit of gas from Russia to the countries of the European Union. Therefore, it is logical to initiate the construction of an extensive network of LNG terminals, which will contribute to the most effective diversification of gas supply both to Ukraine and European countries. It is the development of the mentioned infrastructure for gas storage that will make it possible to significantly increase the level of reliability of the gas supply process, especially during peak periods, and also reduce price fluctuations in the industry market, which have recently become somewhat chronic as a result of the war.

Therefore, the optimization of tax legislation tools, limitation of financial burden, and stimulation of qualitative and quantitative innovations at enterprises of the gas sector in their totality will create tangible conditions aimed at improving the situation in the field of subsoil use, which is vitally necessary at this time for our state - Ukraine.

Under the conditions of the shortage of energy resources in Europe and Ukraine, in connection with the termination of the transit of energy carriers (natural gas) from Russia, a question arises. At the expense of which resources and technologies can the energy demand (incurred losses) be compensated?

Therefore, we believe that the primary attention should be paid to alternative approaches to obtaining energy (burning shavings, peat, solar, wind, hydrogen energy, etc.). This will make it possible to adequately implement renewable energy sources to replace a share of Russian gas, but this process will not be quick.

Given the absence of any import aid in the form of energy supply, it is necessary to speak and act in the direction of stimulating the activities of subsoil users, following the specifics of the market, taking into account the duration and complexity of obtaining a license.

Regarding the 2nd criterion of compliance with energy security: ensuring free access by all gas market participants to the resource of JSC "Ukrgezvydobuvannya" and promoting compliance with competitive mechanisms.

It is known that AT "Ukrgezvydobuvannya" plays a vital role in ensuring the country's energy security. However, at the same time, the monopoly right to gas production does not contribute to the competitiveness of this direction.

The main reason for this progress should be considered the investments of the past years, which were invested in developing and drilling new wells by domestic and foreign investors to extract natural gas. Therefore, the leading security tools according to criterion 2 are:

- accumulation and activation of efforts to cooperate with foreign partners in the direction of the development of underground gas infrastructure. This project aims at Ukraine's energy independence, especially during the war, and to increase energy security. There is already experience of similar cooperation in the PEC (Production Enhancement Contracts) format in 13 fields in Western Ukraine [18].

In particular, the foreign investor "Expert Petroleum" has already contributed to the primary production growth due to operations on intensification and modernization of land infrastructure facilities. However, this is not enough, especially under wartime security conditions. Therefore, we believe it is worth intensifying efforts to develop underground gas infrastructure and further innovative, technological, and material support from our partners.

- increasing gas production and drilling new wells by involving independent entities. Also, despite the war in Ukraine, JSC "Ukrgezvydobuvannya" continues to carry out work aimed at launching a new well more than 6,000 meters deep, located in the Poltava region with a total potential volume of up to 100,000 cubic meters. m. of natural gas per day. This is, in its content, a relatively positive trend in increasing the supply of energy resources. However, the formation of open auctions to increase the number of entities involved in exploration work would have a much more significant effect and result.

- Forming electronic auctions regarding the free access of entities that can conduct geo exploration work on drilling wells and other activities to increase gas production.

At the beginning of the hostilities, the Prime Minister of Ukraine, Denys Shmyhal, set a fundamental task for JSC "Ukrgezvydobuvannya" to increase the volume of natural gas production by the end of 2022 to 10 percent. It should be noted that after the adoption of the "Energy Strategy of Ukraine" already this year, JSC "Ukrgezvydobuvannya" presented its pre-developed Strategy of "accessibility" of the competitive environment among Ukrainian and international industry companies (enterprises) through possible cooperation in the format of "Production Enhancement Contracts" (RES).

The main goal of this cooperation is to find experienced and reliable partners for the accumulation of joint efforts in order to carry out modernization and operational management of works concerning 35 gas fields.

It should be noted that in this direction, simplifying the regulatory regime of gas production, reducing rent payments, especially for deep and ultra-deep wells, and introducing the most modern technologies for the utilization of associated oil gas are incredibly timely and necessary measures.

In addition, a comprehensive audit of the implementation of the program to increase natural gas production should be conducted by the beginning of 2023, with the further provision of financial and managerial autonomy of JSC "Ukrgezvydobuvannya" by separating the company from the corporate management structure of JSC "Naftogaz of Ukraine" [10].

The 3rd criterion for achieving energy security in the gas sector in the direction of transparent regulation of activity is the National Commission, which carries out state regulation in the fields of energy and communal services with further non-discriminatory functioning of the gas market and objective tariff formation. It is known that the National Commission, which carries out state regulation in the spheres of energy and communal services, is an independent state and collegial body, the primary purpose of which is the implementation of state regulation, monitoring, and control over the activities of business entities in the energy and communal spheres.

To ensure the transparency of the activity of the relevant body, the following tools should be implemented:

- to implement the informative system "electronic passport of the licensee" and the mobile application "Energy Online." Most experts and theoreticians, given today's stormy times, believe that ensuring a fair policy of setting tariffs for energy services can be achieved primarily due to the transparency of the professional activity of the National Commission, which carries out state regulation in the fields of energy and communal services.

For example, the creation of an information complex "Electronic passport of the licensee," which will informatively and comprehensively combine all data for its purpose and will include the history of the licensee, as well as: what documents should be submitted to obtain licenses, existing tariffs, an investment program for the development of the enterprise, further implementation control over the execution of license control, settlement of legal disputes and issues.

This is especially relevant against the backdrop of an increase in the actual market value of natural gas, but not its revision in the tariff for operators of the gas transportation network and gas distribution networks that consume blue fuel for their own needs. Implementing planned innovative information technologies will make it possible to adhere to the principles of displaying actual costs and their repayment of compensation, which will have a more significant impact on the final value of the results of the implementation of the tariff formation procedure.

The 4th criterion for the availability of energy security in the gas sector provides for a significant strengthening of the role of state and market regulation, subject to mandatory reform, as well as the nationalization of gas production and geological exploration works by industry market entities. In this direction, the functions regulated by the state through the activities of the National Commission, which carries out state regulation in the fields of energy and communal services and market regulation by ensuring a competitive supply and demand mechanism in the natural gas market, should be distinguished.

- strengthening the role of regulating the activities of gas market entities through monitoring, licensing, and control by the National Commission, which carries out state regulation in energy and communal services. Under such conditions, several directions for further regulation should be identified:

1) Creation of conditions for transparent and maximally effective functioning and further development of markets in the spheres of energy and communal services;

2) Ensuring the principles of openness, as well as non-discriminatory access to networks and pipelines in markets in the fields of energy and communal services by the subjects of industry management;

3) Permanently, the implementation of measures regarding the implementation of regulatory frameworks, foundations, and integration of the electricity and natural gas markets of Ukraine with the Energy Systems of other countries within the framework of the Energy Community, the "Energy Strategy of Ukraine," in cooperation with the Council of Regulators of the Energy Community, the Secretariat of the Energy Community and National energy regulators of other states;

4) Creation of social conditions for the protection of the rights and needs of consumers of goods and services in the spheres of energy and communal services in the direction of ensuring proper quality and unlimited quantity, as well as an economically justified price for obtaining these goods and services;

5) Strengthening measures regarding energy security in the direction of conducting trade with the countries of Europe and the civilized democratic world in the electric energy and natural gas, increasing the level of investment attractiveness for the development of energy infrastructure;

6) Control over suppliers and producers of gas resources regarding their use of modern tools for objectivity and systematic accounting of gas consumption volumes by consumers for further objective pricing;

7) Strengthening the level of energy efficiency and energy saving in terms of increasing the production and generation of energy from renewable energy sources and further protection of the surrounding natural and social environment;

8) Formation of a comprehensive approach to the implementation of mandatory conditions for assistance in attracting the necessary volume of investments in the further development of markets in the spheres of energy and communal services;

9) Formation of an accessible and transparent competitive environment by limiting the monopolistic influence and stimulating the activity and development of all market stakeholders;

10) Formation of a system of other measures aimed at achieving the development and reproduction of the gas sector in Ukraine.

Market instruments for regulating the activity of the natural gas market and achieving the appropriate level of energy security.

As for the instruments for introducing market approaches to the regulation of the energy security system, we believe that they should be classified at the microeconomic, macroeconomic, and mesoeconomic levels.

5th criterion: application of new forms of organization of relations between important components of innovative product development, educational and scientific space, and information.

To date, the dualism of education is focused on obtaining theoretical and practical competencies, which in their content complement each other and meaningfully provide for the "systematic" interaction between the most critical components in the specified process.

Therefore, taking into account the new challenges of the economic situation of the country, in order to achieve the desired effect as quickly as possible - the appropriate level of energy security, it is necessary to follow and implement partnership relations between educational, scientific, and production structures of the oil and gas complex. In this sense, the consolidation of their efforts in the following areas should be considered:

- the development and implementation of the relevant regulatory and legislative framework, which clarifies several conditions regarding the definition of directions, mechanisms, and tools of state support for the system of partnership relations between scientific, educational, and industrial (specialized) institutions. A unique role here is played by the so-called educational space, which is focused on the professional training of gas industry specialists, the primary purpose of which is the ability and understanding of the specifics of certain types of work, the technological approbation of the use of modern equipment in the activities of gas production and gas distribution enterprises;
- change like services provided by educational institutions from theoretical to fundamental and applied directly. After all, the applied component is a critical "stage" of training a future specialist-specialist-professional.

In turn, this requires implementation within the educational space of industrial training at the enterprises of the oil and gas complex; improvement of the mastery level of the teaching potential with further use of the acquired experience in the formation of training courses and programs; unification of curricula and programs following the requests of production structures; analysis and research of fundamental problems of oil and gas sector enterprises; implementation of joint projects and programs, forecasting the dynamics of economic processes on the gas market [4].

- the development of innovation-venture-type infrastructure by introducing the activities of network business incubators, innovation laboratories, etc., which are designed to combine the interests of the academic, branch, and university science, as well as, on this basis, the everyday use of scientific, scientific-technical and educational-production competences.

This process involves the formation of contractual conditions for further interaction between enterprises of the gas complex and educational institutions [7].

Criterion 6 provides for an increase in own production of natural gas, as well as exploration and production of gas.

As already mentioned, the main goal of our country's energy independence under war conditions is to increase its production of energy resources. For this purpose, JSC "Ukrgezvydobuvannya" was tasked with exploring and increasing natural gas production by the end of the year.

However, it should be said that despite the sufficient potential of gas resources, they are always lacking. What is the reason?

An interesting fact is that JSC "Ukrgezvydobuvannya" develops an average of 140 deposits yearly. The largest of them was discovered in the 70s of the last century. However, today they are on the verge of depleting their resources. For example, more than 400 wells have been drilled since the 1960s at the largest Shebelinsky deposit, which was "bombed" in April 2022 by the Russian invaders. Today, the level of its exhaustion is about 90%.

The most promising forecasts for the development of this field are the partial restoration of its potential no earlier than in just ten years. However, even if there is a significant number of operations, it will not be possible to stop the fall in production on them in general. However, some of the already depleted deposits are still capable of achieving high production growth rates, according to JSC "Ukrgezvydobuvannya" forecasts.

In particular, we are talking about the Berezhivskoye deposit in the Kharkiv region. The deposit itself has been developed since 1983, and by this time, it is already depleted by about - 76%, and the remaining natural gas amounts to - 5.2 billion cubic meters. It is also expected to increase the volume of natural gas production at one of the largest deposits in Ukraine - Yablunivskiy.

It was opened way back in 1977 within the limits of the Lokhvytsky district of the Poltava region. During the period of operation of this deposit since 1983, more than 60 billion cubic meters have been removed from it. Natural gas.

This field is considered the next annual production volume, conducted by JSC "Ukrgezvydobuvannya." It contains significant gas deposits and is characterized by the tremendous

possible potential for its practical application. However, the amount of depletion is also significant today and reaches about 70% of the total estimated resource.

According to the strategic plans, JSC "Ukrgezvydobuvannya" aims only to increase the production volume of natural gas reserves at the indicated field to another 15 billion cubic meters.

Another focus is the Chutivskoye deposit, located on the territorial border between the Poltava and Kharkiv regions.

This deposit has been exploited since 1995, and its gas potential is almost exhausted as of today. The rest of its potential is 1.3 billion cubic meters. Natural gas. However, specific measures are constantly being intensified at the deposit, increasing its practical application's economic and production effects. In this sense, specific works have already been carried out to improve the ground infrastructure, optimizing the stress on the wells and reducing the duration of exploration and production of the energy product. As a result, the productivity of the wells was significantly increased. As a result, the annual indicator of natural gas production volumes increased from 166 to 266 million cubic meters last year, or 1.6 times. It should also be noted that significant work was carried out at the Machukh and Semirenkiv deposits in the direction of drilling four wells.

Summarizing, it should be noted that during 2021, gas production by private companies increased by -6% (compared to 2020). In our opinion, the main reason for the noted progress should be considered the investments of the past years, which were invested in drilling completely new gas wells by domestic and foreign investors.

The state has already taken several necessary steps in this direction - launched electronic auctions for the sale of licenses for new oil and gas fields, and approved agreements on the distribution of products with investors for newer and more significant assets. At the same time, strategic projects were restarted - Yuzivska Square and near the Black Sea.

Considering question 7 of the gas security criterion, it should be noted that varying forms of state and market regulatory instruments can restore stable and safe gas supply to some extent.

Among the main tools for achieving energy security about this criterion, the following should be highlighted:

- gas network redesign projects. Formation of the underground network of gas pipelines, their replacement from steel to polyethylene.

Even before a full-scale invasion by the Russian enemy started, Ukrainian gas distribution companies paid considerable attention to developing gas network redesign projects. The basis of this redesign was a technical reorganization that optimizes and promotes the use of excess capacities and eliminates emergency areas and non-functioning or outdated gas control equipment. In connection with the beginning of the redesign process in 2019-2021, which allowed the installation of modern gas control equipment, there is an opportunity to respond to damage to particular areas in a timely and productive manner. Previously introduced technological solutions already allow to switch energy flows in safe cases and continue to implement the procedure of supplying gas resources.

In technological changes, increasing the role of safety against damage to gas networks should be considered. We are talking about the creation of the so-called underground laying, which provides for the protection of aboveground gas pipelines. This will protect the pipes from physical impacts and fragments. In addition, building regulations allow installing gas control cabinets in underground places. For example, it can be wells, mines, or other artificially made underground fortifications.

It is also meaningful to talk about the redesign of gas pipes themselves because they should be replaced from outdated steel ones with polyethylene ones. Under the conditions of war including, polyethylene is a more plastic material, and under the conditions of a projectile hit, it has a higher probability of preserving its integrity. Also, a polyethylene pipe is more flexible during installation, and subsequent maintenance is characterized by a significantly longer service life and is less vulnerable to chemical and electrochemical reactions. In the case of damage to the CHP in cities, the possibility of providing high-rise housing with individual heating with additional underground gas supply to a specific settlement should be considered.

- systematic decentralization of the city's energy supply infrastructure. Maintaining the safety of energy facilities for their continued operation is a much broader issue than partial restoration. Based on the instability of the peaceful atmosphere in Ukraine and the constant probability of a possible attack by Russia, the gas industry should be adapted so that it can fulfill its strategic function under peaceful and military developments. This aspect requires significant reformatting of the energy system into decentralization levers of development.

In our opinion, it is decentralization that acts as a tool for leveling the problem of vulnerability and insecurity of Ukrainian cities. Any military act brings massive destruction and total energy damage. Unfortunately, the Ukrainian experience shows that entire systems of heat, electricity, and gas supply are affected, the destruction of which can endanger the future existence of the city, especially in terms of preparing for winter – the more significant the settlement, the greater this threat. Therefore, many practitioners and theoreticians in energy security issues are inclined to understand the decentralization of the infrastructure so that in the event of a problem, it can be solved promptly.

That is, we are talking about the formation of a resource-efficient, safe, decentralized economic system, which is maximally oriented to ensuring the maintenance of the required level of security even under adverse circumstances. Decentralization processes will make it possible to optimize losses of redundancy during the distribution of energy resources to one point of consumption, reserve and produce the necessary balance of alternative energy sources, create reserve fuel farms, etc. In particular, as regards fuel farms, they used fuel oil and coal today. Their primary raw materials can be waste from local agriculture, biogas mixtures, etc.

We are talking about the formation of a system, but under the conditions of decentralization of the energy infrastructure, to focus its activities on meeting the needs of the new economic system. Over time, these issues will affect the provision of social standards, necessary needs, roads, communications, etc.

- the concept of using alternative forms of gas resources and further gas reservation. Gas reservation is a mandatory attribute of energy independence and an impetus to the city's energy security. However, given the difficulty of supplying and extracting this resource under war conditions, it is acceptable and necessary to use all forms of gaseous fuel as much as possible - natural gas, hydrogen mixture, biogas, synthetic and pyrolysis gases. These gas resource alternatives can be applied locally to maintain the energy balance of certain facilities in order to be able to continue to reserve natural gas. This, in turn, requires the development of an investment feasibility algorithm.

- application of an effective state energy management system at gas enterprises. The Cabinet of Ministers already considered the issue of the need for energy management in December 2021. Today, this is a highly urgent task and allows for the rational use of energy resources given their scarcity and limitation. This will make it possible to optimize staff awareness and monitor and control the availability and rational use of energy resources and gas sector entities.

- reduction of rent payments and simplification of the regulatory regime of gas production. This aspect is especially relevant for deep and ultra-deep wells. We believe that it would be especially appropriate to apply innovative technologies for the utilization of associated oil gas and, at the same time, to conserve exhausted and unpromising wells. It is also necessary to initiate and conduct an additional, comprehensive audit of the program's implementation to increase gas production until 2023. A separate issue should be the need to observe the financial and managerial autonomy of JSC "Ukrgezvydobuvannya" by separating the company from the corporate management structure of JSC "Naftogaz of Ukraine" in order to ensure transparency of work and avoid monopolistic influence.

CONCLUSION

So, as a result of the analysis of the energy security system of our country in the direction of the provision in the gas sector, problematic issues were identified, which are consequently the result of the war and the loss of functioning of a large part of the gas infrastructure as a result of the damage that occurred.

In our opinion, the solution to this issue lies precisely in the plane of the seven proposed criteria for ensuring and further compliance with energy security, which by their content at the systemic level can significantly increase the level of security of the gas sector of Ukraine, even taking into account the further increase in the level of military security, which is not particularly attractive for Ukraine aggression. However, implementing these criteria involves consolidating opinions, tools, and measures of interaction between the state, gas enterprises, and consumers.

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МЕТОДИКА РЕАЛІЗАЦІЇ ЗАБЕЗПЕЧЕННЯ, РЕГУЛЮВАННЯ ТА КОНТРОЛЮ ЗА ДОТРИМАННЯМ НАЛЕЖНОГО РІВНЯ ЕФЕКТИВНОСТІ СИСТЕМИ ЕНЕРГЕТИЧНОЇ БЕЗПЕКИ В УКРАЇНІ

Любомир МАТІЙЧУК¹, Олена ПАВЛОВА², Костянтин ПАВЛОВ²

¹ Тернопільський національний технічний університет імені Івана Пулюя

² Волинський національного університету імені Лесі Українки

Розглянуто проблему «системності» критеріїв безпековості газової сфери в Україні, де варто на самперед було обгрунтувати, а також проаналізувати сутнісне наповнення кожного з чітко окреслених критеріїв в структурі системності та загальності підходу, серед яких: Стосовно першого критерію безпековості, який змістовно стосується питань усунення перешкод та дефіциту газового ресурсу з подальшою пропозицією на галузевому ринку - стимулювання діяльності надророзробників; Стосовно 2-го критерію дотримання енергетичної безпеки: забезпечення вільного доступу усіма учасниками газового ринку до ресурсу АТ «Укргазвидобування» та пропагування дотримання конкурентних механізмів - акумуляція та активізація зусиль щодо співпраці з іноземними партнерами в напрямі розвитку підземної газової інфраструктури; збільшення видобутку газу та буріння нових свердловин шляхом залучення незалежних суб'єктів; формування електронних аукціонів щодо вільного доступу суб'єктів, які можуть проводити георозвідувальні роботи щодо буріння свердловин та іншої діяльності націленої на збільшення видобутку газу; 3-й критерій досягнення енергетичної безпеки газової сфери в напрямі прозорого регулювання діяльності НКРЕКП з подальшим недискримінаційним функціонуванням ринку газу та об'єктивним тарифоутворенням - запровадити інформативну систему «електронний паспорт ліцензіата» та мобільного додатку "Енергетика онлайн". 4-й критерій доступності енергетичної безпеки газової сфери передбачає - посилення ролі регулювання діяльності суб'єктів ринку газу через моніторинг, ліцензування та контроль з боку Національної комісії, що здійснює державне регулювання у сферах енергетики та комунальних послуг. 5-й критерій: застосування нових форм організації взаємовідносин між важливими складовими інноваційного розвитку виробництва, освітньо-науковим простором та інформацією - розробка та впровадження відповідної нормативно-законодавчої бази, яка передбачає з'ясування ряду умов відносно визначення напрямів, механізмів та інструментів державної підтримки системи партнерських відносин між науковими, освітніми та виробничими (профільними) установами; розвиток інфраструктури інноваційно-венчурного типу шляхом запровадження діяльності мережевих бізнес інкубаторів, інноваційних лабораторій тощо, які покликані поєднувати інтереси академічної, галузевої та університетської науки, а також на цій основі, спільного використання наукової, науково-технічної та навчально-виробничої компетентностей. Критерій – 6, передбачає збільшення власного видобутку природного газу, а також розвідку та видобуток газу. Розглядаючи питання 7 критерію безпековості газової сфери, слід відмітити що змінні форми поєднання державного та ринкового інструментів регулювання є спроможними відновити у якійсь мірі стабільне та безпечне газопостачання - проекти по редизайну газових мереж. Формування підземної сітки газопроводів, заміна їх з сталевих на поліетиленові; системна децентралізація інфраструктури енергопостачання міста; концепція застосування альтернативних форм газових ресурсів та подальше резервування газу; застосування ефективної державної системи енергоменеджменту на підприємствах газової сфери; зменшення рентних платежів та спрощення регуляторного режиму видобутку газу.

Ключові слова: ефективність енергетичної безпеки, система безпеки, енергетична безпека, методичні підходи, регулювання рівня безпеки.