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Institutional framework for the implementation of the mechanism of functioning and development of the sphere of generation and distribution of energy generated from renewable sources in the western region of Ukraine

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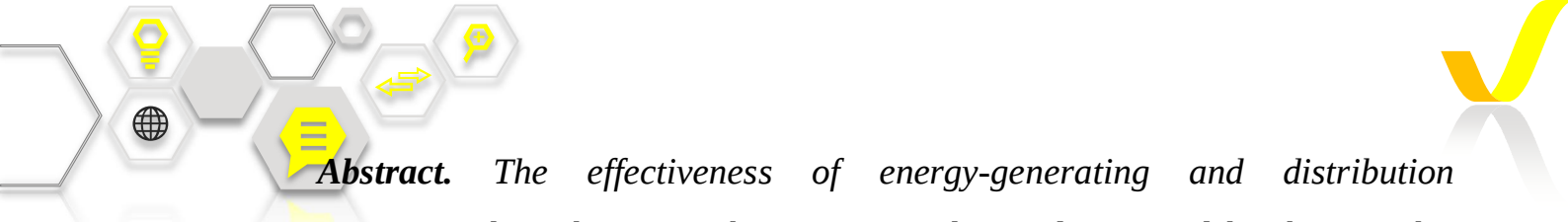
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Abstract. *The effectiveness of energy-generating and distribution organizations as key players in the energy market is determined by the complex interaction of internal and external factors that shape the institutional environment of their operations. This environment, in turn, influences strategic and operational decisions made by these organizations. In a broad sense, the institutional environment is considered in the context of the institutional approach, focusing on the study of institutions, their structure, formal and informal rules, and the mechanisms by which they influence economic behavior. In a narrow sense, the institutional environment of the energy sector is the result of the direct and indirect influence of public authorities, regulators, and other stakeholders on the activities of these organizations, including tariff setting, licensing, standardization, and other aspects of regulation.*

One of the key areas for improving the efficiency, competitiveness, and effectiveness of the production activities of energy-generating and distribution organizations is the ability of management structures to adapt to dynamic, sometimes unpredictable, changes in the institutional environment. This requires not only monitoring of changes but also proactive management of risks and opportunities. Rapid changes in macro- and microeconomic processes, technological development, consumer preferences, and the political environment determine the specifics of relations between economic entities, including in the energy distribution sector. These changes create both new challenges and new development opportunities.

The instability of the internal and external environment of energy distribution organizations, manifested in fluctuations in demand, changes in energy prices, legislative initiatives, combined with underdeveloped management systems and limited opportunities for strategic planning, stimulates the search for adequate tools, methods, models and practical approaches to the interaction of market participants within the existing, constantly evolving institutional environment. An important aspect is the development of coordination mechanisms between different levels of government and other energy market actors.



Keywords: *institutions, institutional environment, renewable energy sources, energy generation, energy distribution region, organizational management structure, western region, energy sources, renewable energy sources, efficiency, energy efficiency, competitiveness of organizations, energy infrastructure.*

Інституційне середовище ефективного використання потенціалу енергогенеруючих та енергорозподільних організацій західного регіону: генерація та розподіл відновлювальної енергії

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Анотація.

Ефективність функціонування енергогенеруючих та енергорозподільчих організацій, як ключових суб'єктів енергетичного ринку, визначається комплексною взаємодією внутрішніх і зовнішніх факторів, що формують інституційне середовище їхньої діяльності. Це середовище, в свою чергу, впливає на стратегічні та операційні рішення, прийняті в цих організаціях. У широкому розумінні, інституційне середовище розглядається в контексті інституційного під-ходу, акцентуючи увагу на вивченні інститутів, їхньої структури, формальних та неформальних правил, а також механізмів їхнього впливу на економічну поведінку. У вузькому розумінні, інституційне середовище енергетичного сектора є результатом прямого та опосередкованого впливу органів державної влади, регуляторних органів та інших стейкхолдерів на діяльність зазначених організацій, включаючи встановлення тарифів, ліцензування, стандартизацію та інші аспекти регулювання.

Одним із ключових напрямів підвищення ефективності, конкурентоспроможності та результативності виробничої діяльності енергогенеруючих і енергорозподільчих організацій стає здатність управлінських структур адаптуватися до динамічних, а іноді й непередбачуваних, змін інституційного середовища. Це вимагає не тільки моніторингу змін, а й проактивного управління ризиками та можливостями. Швидкі зміни макро- та мікроекономічних процесів, технологічний розвиток, зміни в споживчих перевагах та політичній кон'юктурі зумовлюють специфіку взаємовідносин між суб'єктами економіки, зокрема й в енергорозподільчій сфері. Ці зміни створюють як нові виклики, так і нові можливості для розвитку.

Нестабільність внутрішнього і зовнішнього середовища функціонування енергорозподільчих організацій, що проявляється у коливаннях попиту, змінах цін на енергоносії, законодавчих ініціативах, у поєднанні з недостатньо розвиненими системами управління та обмеженими можливостями для стратегічного планування, стимулює пошук адекватних



інструментів, методів, моделей та практичних підходів до взаємодії учасників ринку в межах існуючого, постійно еволюціонуючого інституційного середовища. Важливим аспектом є розробка механізмів координації між різними рівнями управління та різними суб'єктами енергетичного ринку.

Ключові слова: *інституції, інституційне середовище, відновлювальні джерела енергії, енергогенерація, енергетичний розподіл регіон, організаційна структура управління, західний регіон, енергетичні джерела, ВДЕ, ефективність, енергетична ефективність, конкурентоспроможність організацій, енергетична інфраструктура.*

Problem statement. In general, to comply with effective norms and rules of conduct for energy-generating and energy-distribution organizations, one should consider internal and external factors that form the so-called “institutional environment” of the activities of energy-distribution organizations. In a broad sense, the institutional environment is oriented towards studying institutions and their structure according to the established institutional approach. In a narrow sense, the institutional environment results from the influence on the activities of energy-generating and energy-distribution organizations of several authorities of direct and indirect action. Typically, state authorities of indirect influence carry out institutional and legal regulation through the Verkhovna Rada of Ukraine, the President of Ukraine, the Cabinet of Ministers of Ukraine, and local and regional authorities within the powers defined by the Constitution of Ukraine.

Analysis of recent research and publications. The problem of the nature and role of the institutional environment of organizations is widely reflected in the scientific literature and has been the subject of research by many scholars. Various approaches to analysing this complex phenomenon demonstrate its multidimensionality and importance for understanding the mechanisms of functioning of modern organizations. Research in this area covers a wide range of issues, from the theoretical and methodological foundations of institutionalism to



applied aspects of the impact of the institutional environment on specific areas of activity. Among the scholars whose works have made a significant contribution to the development of this area are such researchers as S. Galit [2], V. Kupchak [3], V. Lahodienko [3], O. Novosad [6], K. Pavlov [8-11, 13], O. Pavlova [8-11, 13], and M. Korota [8]. Their works, in particular, deal with the formation of the institutional environment, its structure, dynamics, and impact on the efficiency of organizations in various sectors of the economy. It is worth noting that this list of authors is not exhaustive, but it illustrates the activity of scientific research in the outlined problem area.

Despite the considerable scholarly interest in the institutional environment in general, the impact of a well-structured institutional framework on the production and economic performance of regional electricity distribution networks in the renewable energy sector remains insufficiently explored. The scientific literature lacks comprehensive studies that systematically analyse the relationship between institutional factors and specific performance indicators of electricity distribution networks specializing in renewable energy sources at the regional level. This research gap complicates the development of sound public policy in the energy sector and hinders the formulation of effective strategies for the development of energy enterprises. Therefore, there is an urgent need for an in-depth study aimed at identifying and quantitatively assessing the impact of institutional factors, which would contribute to both the theoretical understanding of the issue and the practical implementation of effective institutional mechanisms in the energy sector. It is also necessary to determine the institutional factors that influence the formation of effective models of enterprise functioning in the field of RES and to justify the directions for improving institutional support to stimulate the development of renewable energy at the regional level.

Formulation of the article's goals (task statement). The article aims to study the institutional environment to effectively use the potential of energy-generating and energy-distribution organizations in the western region's renewable energy generation and distribution structure.



Presentation of the primary research material. A key area of activity of energy-generating and distribution organizations aimed at improving the efficiency and effectiveness of their production activities is the adaptability of management structures to dynamic changes in the institutional environment. This adaptability implies a timely response to changes, proactive forecasting, and the development of appropriate management strategies. The rapidity of macro- and microeconomic processes due to globalization, technological progress, and other factors creates a special type of often non-linear relationship between economic entities in all sectors, including the energy distribution sector, at the level of regional entities [9].

The institutional changes that occur under the influence of these processes require energy companies to be flexible, innovative, and able to learn and implement new management practices quickly. It is also necessary to consider the specifics of a particular region's institutional environment, as it can significantly affect the opportunities and constraints for developing energy distribution organizations.

The stability of Ukraine's economic development as a complex socioeconomic system is determined by the influence of various factors forming a specific institutional environment. This environment is not a static structure but a dynamic system of interconnected elements that is constantly evolving. According to the leading theories of socioeconomic systems development, achieving maximum performance indicators, including economic growth, is possible, provided that the system interacts effectively with the external environment and adapts to its changes promptly [10]. The system should respond to and anticipate external influences by forming appropriate adaptation mechanisms.

The category of “development” in its essential content implies the existence of a cause-and-effect relationship that covers the processes of qualitative improvement of the system, its ability to adapt sustainably in a changing environment, and the formation of mutual influences and interdependencies with other elements within a particular structural organization. In addition, development is inextricably linked to solving complex, multidimensional problems considered in the context of time and space coordinates [4].



Summarizing the above, it should be emphasized that the functioning and development of any business entity are inextricably linked to the institutional environment specific to their activities. This environment directly impacts the decision-making process, mediating it through the dominance of institutions, formal and informal rules, norms, and practices. As established structures of interaction, institutions set the framework and constraints for economic behavior and can create incentives or obstacles to development. Thus, the development of both individual organizations and entire sectors of the economy is primarily determined by the characteristics of the relevant institutional environment and the efficiency of its functioning [11].

Energy distribution companies are intermediaries in the energy market. Various external factors significantly influence them. These factors, such as the political direction and priorities set by local and regional authorities, the strategic development of the gas industry at the state level, and the current legal framework governing energy supply, all play a crucial role in shaping their operations [12].

One of the key problems hindering the development of local gas markets is the imperfection of the legal framework governing the relationship between its participants. This is manifested in the lack of clarity in defining the parties' rights and obligations, gaps in legislation, and contradictions between different regulations.

In addition, the activities of energy-generating and distribution organizations are highly dependent on the changing characteristics of the regional environment. The most important of these characteristics include the socio-economic situation in the region, including the level of population income, employment, and investment activity; the peculiarities of the internal organizational management structure of energy companies themselves, their ability to adapt and innovate; and the presence and intensity of competition in the region, including both inter- and intra-industry competition [13].

Along with external factors, the formation of an adaptive and transparent institutional environment is significantly influenced by internal factors directly



related to energy distribution organizations' activities and regional development characteristics.

These factors include changes in the conjuncture of individual and legal entity consumer demand, the introduction of innovative technological innovations by energy distribution organizations, the socio-economic potential of the region's development, the availability of a customer service advisory and information network, and the ro-bust organizational system of internal management of production activities [1]. This system ensures the efficiency and effectiveness of our operations.

The institutions of direct action include Ukraine's relevant Ministries, Commissions, and internal institutional structure [7].

A well-developed institutional environment is characterized by efficiently functioning institutions and high coordination and coherence. These institutions, not just formally present but also practical, enforce the rules and regulations and contribute to achieving the system's development goals. Their active participation creates a multiplier effect, exerting a significant systemic impact on various aspects of the activities of energy distribution organizations [14].

The mutual coherence of institutions provides a synergistic effect when joint action leads to results that exceed the sum of the results from the activities of individual institutions.

When studying the nature of institutions and their impact on the development of organizations, they should be divided into active and passive. An asset is an established and generally accepted rule of behavior. These include the Constitution of the state, laws, codes, and several other legislative documents; passive institutions include all forms of cooperation without legislative consolidation but are generally accepted in everyday life, including habits, traditions, and stereotypes caused by psychological characteristics and dogmas of society. Active institutions operate exclusively in the legal field and form functions mandatory for execution. At the same time, the state will achieve the required level of development of organizations through direct and indirect regulatory methods [9].

To conduct a comprehensive analysis of the institutional environment of the energy distribution sector, it is necessary to differentiate between the concepts of "institution" and "institutional," considering them in the context of how this environment functions. It is advisable to distinguish between the external and internal circles of the institutional environment (see Figure 1). Such structuring allows the systematization of various influence factors and determines their hierarchy.

Direct methods of state regulation, which are embodied in economic policy, are based on legally established norms and rules. State policy aimed at realizing citizens' constitutional rights and obligations plays a key role in shaping the institutional environment. Achieving a synergistic effect from the interaction of society and a balanced economic policy is possible only if the activities of business entities, including energy distribution organizations, are coordinated with civil society institutions. This coordination involves considering various stakeholders' interests and ensuring transparency and accountability.

Public policy is an exogenous (external) factor influencing the institutional environment of the energy distribution sector. The effectiveness of public administration in this area, which is manifested in the quality of sectoral management by the authorities, directly determines the quality of the institutional environment. Ineffective management, on the contrary, can lead to institutional traps and dysfunctions (Figure 1).

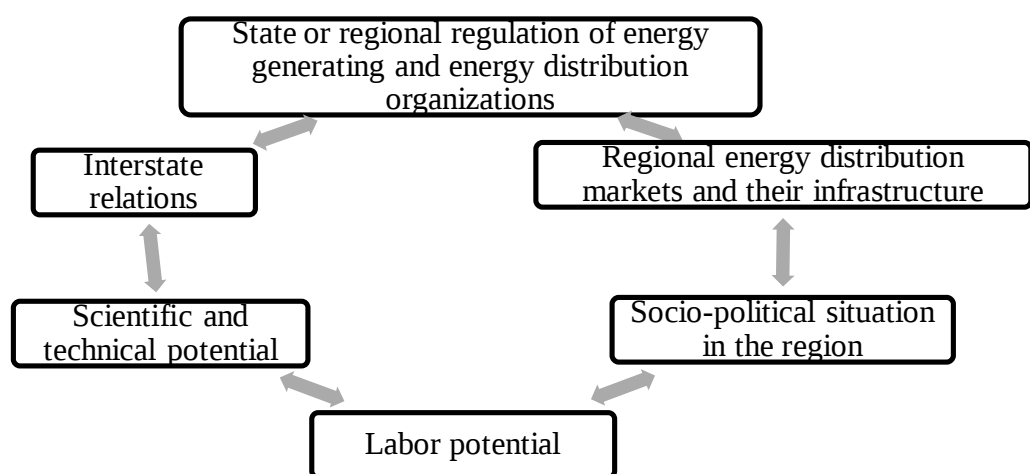


Fig. 1. Institutions and institutions in the context of the institutional environment



Source: [15]

The outer circle should be understood as institutions and agencies that have a macroeconomic impact on energy distribution organizations [15].

These institutions form the institutional environment through the cycle of functioning processes in the energy distribution sector, where the following main components deserve special attention:

- state or regional regulation of energy distribution organizations;
- Regional energy distribution markets and their infrastructure include oil and gas production and energy distribution organizations, industrial and commodity organizations, stock exchanges, banks, financial and credit intermediaries, insurance agencies, employment services, and other organizations;
- The socio-political situation in the region includes public organizations, international partners, political centres, communication networks, information support, and service centres;
- The labor potential is concentrated mainly in educational institutions, post-graduate education, and professional training systems for the oil and gas industry;
- The peculiarity of this institutional segment is the sufficient professional level of specialists in the oil and gas industry, the development of distance learning, and the low level of international exchange of experience and information.
- The scientific and technical potential is a component of research institutes, international specialists, organizations, and institutions.

Interstate relations allow for organizing interstate relations, global legislation, and the existence of a transnational company or a multinational corporation.

The main goals of this segment are to diversify sources and routes of gas supply to domestic markets.

External institutions undoubtedly have a significant impact on the activities of energy distribution organizations. These institutions include international organizations, foreign partners, and institutional frameworks in other countries. However, the state plays a decisive role in shaping the operating environment, in particular, in creating pressure on the internal environment of these organizations,



as it is the architect of any national institutional environment. The state establishes the “rules of the game” by defining the legislative and regulatory framework, regulatory policy, control, and enforcement mechanisms.

The quality of public administration institutions' functioning, efficiency, and ability to adapt to changes are integral to sectoral management for which the authorities are responsible. These individuals' competence, professionalism, and strategic vision ensure the effective functioning of the energy distribution sector, particularly the creation of conditions for fair competition and equality between market participants.

Introduce a system of restrictions and incentives to balance interests between different participants in the energy distribution market, such as producers, suppliers, consumers, and the state. These constraints and incentives should be clearly defined, transparent, consistent, and supported by effective monitoring and enforcement mechanisms [7].

At the same time, the activities of energy distribution organizations are also influenced by internal institutional elements. Among them are:

- organizational and production structure of the energy distribution organization;
- tariff differentiation in the organization;
- socio-economic features and characteristics of the region;
- competitiveness of organizations;
- customer service centres.

An integrated approach to analysing the institutional environment of energy distribution organizations in the region must consider certain aspects [1].

Organizations in the energy distribution sector typically operate in a natural monopoly environment characterized by the absence or significant restriction of competition. This is due to the industry's economic and technological peculiarities, such as high fixed costs, economies of scale, and the need to create a unified infrastructure. As a result, regardless of the form of ownership (public, private, or mixed), such organizations are subject to increased social responsibility [8].



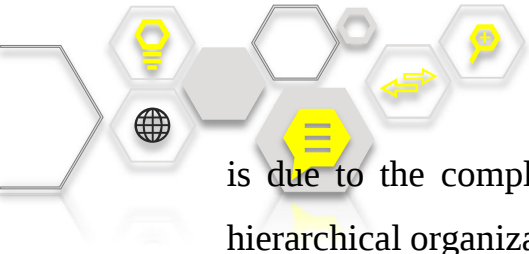
Another essential aspect that can potentially contribute to the positive impact of the institutional environment on the energy sector is the attraction of capital investments and further development of privatization processes in energy transportation and distribution organizations. Privatization, if conducted transparently and efficiently, can help improve management efficiency, attract new technologies, improve the quality of services, and reduce costs. However, in today's complex economic and political realities of Ukraine, implementing large-scale privatization projects in the energy sector is extremely difficult or even impossible [7].

Another problematic aspect of the functioning of the energy distribution sector is the emergence of non-transparent contractual relations between consumers and suppliers of gas resources. This problem exists even in a formally defined legal environment that regulates their interaction [4].

Properly organized institutional support for the functioning of the energy distribution sector is a critical factor that will contribute to achieving significant production and economic effects at both the regional (meso) and national (macro) levels. An effective institutional environment creates favourable conditions for attracting investment, introducing innovations, increasing resource efficiency, and reducing costs.

The creation of effective controlling institutional entities plays a key role in ensuring the efficient functioning of energy-generating and distribution organizations. These entities, endowed with the necessary powers and resources, should monitor the organizations' activities, ensure product and service quality improvement, and encourage market participants to save energy, use resources efficiently, and respect the environment. It is essential that regulatory authorities are independent, professional, and impartial and that their activities are transparent and accountable.

Another important aspect is the integrity of energy-generating and distribution organizations in a vertically integrated operation system. According to institutional theory, vertically integrated structures may incur significant transaction costs. This



is due to the complexity of management, coordination, and control within large hierarchical organizations. Vertical integration is often one factor contributing to the emergence of the shadow economy, mainly through opportunities for income concealment, tax evasion, and other illegal activities. Therefore, along with the creation of regulatory bodies, it is essential to optimize the structure of energy companies and implement mechanisms to prevent abuse (Figure 2).

Institutional support for the functioning of the gas distribution system	Production effect that forms regional (seasonal) welfare: effective production relations with partners and consumers; control measures for accounting and quality of gas resources use; attraction of investment funds for the modernization of facilities of energy generating and energy distribution organizations; optimization of the tariff policy for energy distribution; improving the activities of service and consulting institutions; introduction of modernized management methods and forms; rational use of resources.
	The economic effect that forms the national (macroeconomic) welfare: regulatory and legal support and consideration of distribution organizations; consistency of the chain relationship between the state-energy generating and energy distribution organization-consumer; socio-economic policy for the development of the country's regions; developed and extensive infrastructure; monitoring the activities of regional energy distribution organizations; stimulating the system of education and professional training of workers.

Figure 2. Institutional support for the functioning of the gas distribution system [5].

Source: [5]

To summarize, the effective functioning of the institutions and agencies that form the gas distribution system at both the regional and national levels is a key factor in ensuring sustainable meso- and macroeconomic growth. Interacting with each other, these institutions and agencies define the “rules of the game” for all market participants, affecting the investment climate and innovation activity, as well as the level of competition and transparency in the energy sector. In turn, efficient and effectively interacting institutions and agencies are prerequisites for forming a favourable institutional environment. This environment, in turn, generates both internal (increased efficiency of energy distribution organizations, reduced costs,



improved quality of services) and external (increased budget revenues, increased energy security of the country, improved environmental situation) effects for the energy distribution sector and the economy. These effects must be positive and long-term.

Conclusions. To summarize, we can conclude that the effective functioning of the institutions and agencies that form the gas distribution system at both the regional and national levels is a key factor in ensuring sustainable meso- and macroeconomic growth. Interacting with each other, these institutions and agencies define the “rules of the game” for all market participants, affecting the investment climate and innovation activity, as well as the level of competition and transparency in the energy sector. In turn, efficient and effective interacting institutions and agencies are prerequisites for forming a favourable institutional environment. This environment, in turn, generates both internal (increased efficiency of energy distribution organizations, reduced costs, improved quality of services) and external (increased budget revenues, increased energy security of the country, improved environmental situation) effects for the energy distribution sector and the economy. These effects must be positive and long-term.

The region's energy system is characterized by low electricity generation and consumption and a shortage of funds for modernizing thermal power plants. These features limit opportunities for reconstruction and require the continued operation of existing equipment.

The problem of uneven daily load schedules requires implementing energy-saving measures in all sectors of the economy and households.

Renewable energy development (wind and solar energy systems) requires modernizing and expanding the power grid infrastructure, including substations, distribution points, and cable lines.

Energy efficiency programs aimed at the technological restructuring of the economy have contributed to improving energy efficiency and energy saving in the region.



Список використаних джерел

1. Актуальні проблеми прикладної економіки : кол. монографія / за заг. ред. О.М. Стрішенець. Луцьк. Вежа-Друк. 2017. С. 156.
2. Галянт С. Р. Інституціональне середовище функціонування газорозподільних підприємств: моніторинг та стимулювання : монографія. Луцьк : СПД Гадяк Жанна Володимирівна, друкарня «Волиньполіграф», 2021. 232 с.
3. Купчак В. Р., Лагодієнко В. Р. Формування та регулювання регіональних енергетичних систем: теорія, методологія та практика : монографія. Луцьк: СПД Гадяк Жанна Володимирівна, друкарня «Волиньполіграф», 2019. 346 с.
4. Лелюк О. В. Аналіз особливостей українського ринку видобутку та споживання природного газу. *Бізнес Інформ*. 2013. №11. С.170-179.
5. Лінчевська Н. М., Дзьоба О. Г. Аналіз чинників та організаційно-економічних інструментів забезпечення інноваційного розвитку газотранспортних організацій. *Науковий вісник Івано-Франківського національного технічного університету нафти і газу. Серія Економіка та управління в нафтовій і газовій промисловості*. 2010. №4. С. 82-91.
6. Новосад О. В. Інноваційна політика підвищення конкурентоспроможності регіональних газорозподільних підприємств : монографія. Луцьк: СПД Гадяк Жанна Володимирівна, друкарня «Волиньполіграф», 2021. 295 с.
7. Національної комісії, що здійснює державне регулювання сфери енергетики та комунальних послуг: офіційний вебпортал. URL: <https://www.nerc.gov.ua/>
8. Павлов К. В., Павлова О. М., Коротя М. І. Регулювання діяльності регіональних газорозподільних підприємств України : монографія. Луцьк: СПД Гадяк Жанна Володимирівна, друкарня «Волиньполіграф», 2020. 256 с.



9. Павлова О. М., Павлов К. В., Новосад О. В., Матійчук Л. П. Сутність енергетичної безпеки України в умовах трансформаційних змін. *Актуальні проблеми інноваційної економіки*. 2021. № 2. С. 84-91.

10. Павлова О. М., Павлов К. В., Якимчук А. Ю., Сорокопуд І. В., Галянт С. Р. Енергетичний ринок західного регіону України. *Міжнародний науковий журнал "Інтернаука". Серія: "Економічні науки"*. 2020. № 7. DOI: <https://doi.org/10.25313/2520-2294-2020-7-6202>.

11. Писанко С. В., Романюк Р. В., Павлова О. М., Павлов К. В. Електроенергетичний ринок регіонів України в контексті модернізаційних змін. *Міжнародний науковий журнал "Інтернаука". Серія: "Економічні науки"*. 2020. № 12. DOI: <https://doi.org/10.25313/2520-2294-2020-12-6795>.

12. Романюк Р. В. Організаційно-економічний механізм реформування електроенергетичного ринку в регіонах України : монографія Луцьк: СПД Гадяк Жанна Володимирівна, друкарня «Волиньполіграф», 2022. 223 с.

13. Стрішенець О. М., Павлов К. В. Особливості конкурентних відносин на регіональних ринках нерухомості. *Науковий вісник ужгородського університету. Серія «Економіка»*. Вип. 1 (47). Т. 2. Ужгород, 2016. С. 35-38. URL: http://www.visnyk-ekon-old.uzhnu.edu.ua/images/pubs/47/2/47_2_7.pdf.

14. Pavlova O., Pavlov K., Horal L., Novosad O., Korol S., Perevozova I., Obelnytska K., Daliak N., Protsyshyn O., Popadynet N. Integral estimation of the competitiveness level of the western Ukrainian gas distribution companies. *Accounting*. 2021. № 7 (5), 1073-1084. URL: https://www.growingscience.com/ac/Vol7/ac_2021_57.pdf.

15. Yakymchuk A., Shvec M., Pavlov K., Pavlova O., Irtysheva I., Popadynets N., Boiko Y., Kramarenko I. Optimization of multi-channel queuing systems with a single retail attempt: *Economic approach. Decision Science Letters*. 2020. 9(4), pp. 559-564. URL: <https://growingscience.com/beta/dsl/4211->



optimization-of-multi-channel-queuing-systems-with-a-single-retail-attempt-economic-approach.html.