ECONOMICS AND MANAGEMENT OF ENTERPRISE

DOI: 10.15587/2706-5448.2024.314397

ENTROPY AS A FACTOR OF INFLUENCE ON ENERGY SECURITY MANAGEMENT OF ENTERPRISES

pages 6–12

Viktoriia Prokhorova, *Doctor of Economic Sciences, Professor, Head of Department of Economic and Management, Educational-Scientific "Ukrainian Engineering Pedagogics Academy" of the V. N. Karazin Kharkiv National University, Kharkiv, Ukraine, ORCID: https://orcid.org/0000-0003-2552-2131*

Mykola Budanov, *PhD, Department of Economic and Management, Educational-Scientific "Ukrainian Engineering Pedagogics Academy" of the V. N. Karazin Kharkiv National University, Kharkiv, Ukraine, e-mail: pavelfeofanovich@ukr.net, ORCID: https://orcid.org/0000-0001-8032-0562*

Energy security management of the enterprise in conditions of entropy is an important aspect that includes adaptation to changes in the external environment and internal processes. The object of research is entropy, as a measure of uncertainty and chaos in energy systems, which affects the energy security management of enterprises. The problem of a comprehensive approach to the study and implementation of methods for calculating entropy indicators, which would take into account entropy in the energy security management, is solved.

The conducted analysis shows how the level of entropy in the supply of energy resources, in particular coal, electricity and alternative sources, affects the stability, sustainability and adaptability of management strategies aimed at ensuring energy security management.

The essence of the obtained results is that the study shows the importance of energy security management of enterprises in the conditions of entropy, which is a measure of uncertainty in energy systems. Entropy acts as a key factor influencing the energy security management, as it reflects the level of chaos and uncertainty in the supply of energy resources.

It is shown that the level of entropy directly affects the stability and adaptability of management strategies, which allows enterprises to better respond to external challenges and internal risks. The use of mathematical models, in particular Shannon's formulas, makes it possible to quantitatively assess the level of entropy and identify potential risks arising in energy systems. Awareness of the impact of entropy on management decisions helps enterprises to optimize processes, predict threats and reduce negative consequences.

The research results reflect the complex interplay between entropy, management strategies and external challenges, emphasizing the importance of an adaptive approach in energy security management.

The research focuses on practical aspects. From a practical point of view, awareness of the impact of entropy on management decisions allows enterprises to optimize management processes, predict potential threats, and reduce the negative consequences of external and internal risks.

The results of this research can become the basis for the formation of new management strategies capable of effectively responding to the modern challenges of the energy sector.

Keywords: entropy level, energy security management, enterprise risks, entropy influence, management decisions.

References

1. Bhavsar, R., Helian, N., Sun, Y., Davey, N., Steffert, T., Mayor, D. (2018). Efficient Methods for Calculating Sample Entropy in Time Series Data Analysis. *Procedia Computer Science, 145,* 97–104. https://doi.org/10.1016/j.procs.2018.11.016
2. Ekberg, V., Ryde, U. (2021). On the Use of Interaction Entropy and Related Methods to Estimate Binding Entropies. *Journal of Chemical Theory and Computation, 17 (8),* 5379–5391. https://doi.org/10.1021/acs.jctc.1c00374
3. Chen, C., Sun, S., Cao, Z., Shi, Y., Sun, B., Zhang, X. D. (2019). A comprehensive comparison and overview of R packages for calculating sample entropy. *Biology Methods and Protocols, 4 (1).* https://doi.org/10.1093/biomethods/bpz016
4. Dippo, O. F., Vecchio, K. S. (2021). A universal configurational entropy metric for high-entropy materials. *Scripta Materialia, 201,* 113974. https://doi.org/10.1016/j.scriptamat.2021.113974
5. Asenjo, D., Paillusson, F., Frenkel, D. (2014). Numerical Calculation of Granular Entropy. *Physical Review Letters, 112 (9),* 098002. https://doi.org/10.1103/physrevlett.112.098002
6. Davies, S. R., Macfarlane, R., Buchanan, W. J. (2022). Comparison of Entropy Calculation Methods for Ransomware Encrypted File Identification. *Entropy, 24 (10),* 1503. https://doi.org/10.3390/e24101503
7. Heidari, H., Velichko, A., Murugappan, M., Chowdhury, M. E. H. (2023). Novel techniques for improving NNetEn entropy calculation for short and noisy time series. *Nonlinear Dynamics, 111 (10),* 9305–9326. https://doi.org/10.1007/s11071-023-08298-w
8. Velichko, A., Heidari, H. (2021). A Method for Estimating the Entropy of Time Series Using Artificial Neural Networks. *Entropy, 23 (11),* 1432. https://doi.org/10.3390/e23111432
9. Sherwin, W. B., Prat i Fornells, N. (2019). The Introduction of Entropy and Information Methods to Ecology by Ramon Margalef. *Entropy, 21 (8),* 794. https://doi.org/10.3390/e21080794
10. Prokhorova, V., Budanov, M., Budanov, P. (2024). Devising an integrated methodology for energy safety assessment at an industrial power-generating enterprise. *Transfer of Technologies: Industry, Energy, Nanotechnology, 4 (13 (130)),* 118–131. https://doi.org/10.15587/1729-4061.2024.308056

DOI: 10.15587/2706-5448.2024.314391

METHODICAL ASPECTS OF ANALYSIS AND RISK MANAGEMENT OF AN INSURANCE COMPANY

pages 13–18

Inna Aleksieienko, *PhD, Associate Professor, Department of Finance and Credit, Simon Kuznets Kharkiv National University of Economics, Kharkiv, Ukraine, e-mail: inna01alekseenko@gmail.com, ORCID: https://orcid.org/0000-0002-8803-1615*

Tetiana Kazadaieva, *Educational Scientific Institute of Economics and Law, Simon Kuznets Kharkiv National University of Economics, Kharkiv, Ukraine, ORCID: https://orcid.org/0009-0003-0962-7504*

The object of research is the risks of the insurance company. The paper is devoted to the study of the risks of the insurance company, which generate threats to the level of its solvency. The general state of economic development in general and the insurance market in particular determine the operating conditions of any insurer. The insurance company's ability to regulate such conditions is limited, but the formation of a stable state of the internal environment creates opportunities to adapt to threats from the external environment. Timely detection of potential risks in the activities of the insurer, provision of reserves to cover possible losses related to risks, enable companies to overcome the consequences of risks with minimal losses. The methodical basis for evaluating potential risks in the insurance company's activities is strategic analysis methods, such as PEST and SWOT analysis. Their results give an idea of the state of threats in the

external environment and the potential opportunities of the insurer's internal reserves. The methods of economic-mathematical modeling and forecasting make it possible to assess the current state of the company and investigate its behavior under the influence of external and internal factors. The basis of the forecast model of risk analysis of an insurance company is formed by the coefficient of risk of loss of solvency, calculated according to the key parameters of the assessment of its financial condition. The reliability of the forecast of the possible risk of loss of the insurer's solvency is ensured by constructing a trend line and forming a forecast sheet in the MS Excel software environment. The forecast sheet forms the probabilities of the values of the indicators with a distinction between optimistic and pessimistic levels of the forecast. Using the trend line and finding the value of the coefficient of determination (R^2), the probability of realizing the forecast of growth or reduction in the value of each individual parameter of the model is determined. The practical significance of the obtained results lies in the possibility of increasing the efficiency of the use of available resources and reserves in the process of risk management. The proposed methodical approach can be used to assess the impact of risks in the insurer's activities, which will increase the accuracy of the obtained results.

Keywords: insurance company risks, PEST analysis, SWOT analysis, forecasting, insolvency risk factor.

References

1. Poradova, M., Kollar, B. (2020). Methods of Earnings and Risks Management in Insurance Companies. *Proceedings of the Fifth International Conference on Economic and Business Management (FEBM 2020)*. https://doi.org/10.2991/aebmr.k.201211.063
2. Bosch-Príncep, M., Devolder, P., Domínguez-Fabián, I. (2002) Risk analysis in asset-liability management for pension fund. *Belgian Actuarial Bulletin, 2 (1),* 80–91. Available at: https://www.researchgate.net/profile/Manuela-Bosch-Princep/publication/251762240_Risk_analysis_in_asset-liability_management_for_pension_fund/links/5419bb9e0cf2218008bf9e0e/Risk-analysis-in-asset-liability-management-for-pension-fund.pdf
3. Dluhopolskyi, O., Khroponiuk, D. (2022). Current problems and development prospects of the mortgage market of Ukraine. *Innovation and Sustainability, 1,* 118–126. https://doi.org/10.31649/ins.2023.1.118.126
4. Kolinets, L., Panukhnyk, O., Krupka, A., Zarichna, N., Lavrov, R., Khroponiuk, D. (2023). Financial and Institutional Aspects of Insurance Market Development Under Conditions of Pandemic 2020–2021 and War 2022–2023: Case Of Ukrainian Insurance Companies. *Financial and Credit Activity Problems of Theory and Practice, 5 (52),* 97–110. https://doi.org/10.55643/fcaptp.5.52.2023.4158
5. Vladyka, Y., Shubina, I. (2023). Insurance Risk Management of the Insurer (According to the Materials of the Insurance Company "USG"). *Economy and Society, 55*. https://doi.org/10.32782/2524-0072/2023-55-12
6. Rud, I. Yu., Tkachenko, M., Kramarenko, A. (2019). Methods of risk management in insurance company. *Ekonomika ta upravlinnia pidpryiemstvamy, 3 (71),* 21–26. Available at: http://www.psae-jrnl.nau.in.ua/journal/3_71_2_2019_ukr/3.pdf
7. Podra, O. P., Petryshyn, N. Ya. (2020) Theoretical and methodological aspects of insurance companies risk management. *Menedzhment ta pidpryiemnytstvo v Ukraini: etapy stanovlennia ta problemy rozvytku, 2 (2),* 70–78.
8. Aleksandrova, M. M., Boiar, D. S. (2021). *Mistse strakhovoho rynku v ekonomitsi Ukrainy.* Available at: https://conf.ztu.edu.ua/wp-content/uploads/2021/11/254.pdf
9. Hranovska, I., Yaremenko, L., Malyshko, V. (2023). The current state and problems of the development of the insurance market under the conditions of marital state. *Black Sea Economic Studies, 81,* 167–172. https://doi.org/10.32782/bses.81-26
10. Prystupa, L. A., Kharchuk, O. B. (2017). Conceptual base of the insurance company's competitiveness in the modern market environment. *Ekonomika ta suspilstvo, 13,* 1201–1206. Available at: https://economyandsociety.in.ua/journals/13_ukr/201.pdf
11. Bodnar, O., Khorenzhenko, V., Tatarenkova, Y. (2020). Functioning of the insurance market of Ukraine in the conditions of the COVID-19 pandemic. *Efektyvna Ekonomika, 10.* https://doi.org/10.32702/2307-2105-2020.10.67
12. *Finansova zvitnist.* PAT "SK "Krayina". Available at: https://krayina.com/page/finansova-zvitnist

DOI: 10.15587/2706-5448.2024.314344

FORMATION OF LEADERSHIP COMPETENCES IN THE CONTEXT OF EMERGENT DEVELOPMENT OF THE IT INDUSTRY

pages 19–24

Oksana Zhylinska, *Doctor of Economic Sciences, Professor, Honored Worker of Science and Technology of Ukraine, Department of Management of Innovation and Investment Activities, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine, e-mail: zhylinska@knu.ua, ORCID: https://orcid.org/0000-0001-8366-0474*

Anzhela Tyshchenko, *Department of Management of Innovation and Investment Activities, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine, ORCID: https://orcid.org/0009-0000-9295-962X*

The object of research is processes and approaches to the development of leadership competencies of personnel in IT organizations.

The research is devoted to the analysis of the features of the formation of leadership competencies in the context of the emergent development of the IT industry. The work examines the evolution of concepts of corporate training and their adaptation to the specifics of the IT sphere, which is characterized by a high rate of technological changes and innovation. Traditional and innovative forms of personnel development are analyzed, with a special emphasis on their effectiveness in the context of the IT industry.

A survey was conducted among employees of IT companies, which revealed high leadership potential and willingness to accept responsibility among industry specialists. At the same time, certain gaps in the development of certain competencies have been identified, in particular, regarding the ability to effectively delegate tasks and make risky decisions. The results of the study emphasize the need to adapt traditional leadership models to the unique requirements of the IT industry, with a focus on the development of technical competence, innovative thinking and adaptability.

The paper offers recommendations for improving leadership development programs in IT companies. These recommendations include the implementation of flexible learning formats that combine online and offline components, as well as the use of modern technologies, such as virtual and augmented reality, to develop leadership skills. Special attention is paid to the development of such competencies as managing virtual teams and cross-cultural leadership, which are becoming more and more relevant in the context of the globalization of the IT industry.

The paper outlines directions for further research, in particular the study of the impact of artificial intelligence and machine learning on the formation of leadership competencies in the IT sphere. The results of the study have both theoretical and practical value for the development of effective strategies for the development of leadership potential in IT companies, which will contribute to increasing their competitiveness on the global market.

Keywords: leadership competencies, IT industry, emergentity, leadership development, adaptive leadership, technical competence, personnel development programs.

References

1. Geseleva, N. V., Zaritskaya, N. N. (2013). Emergent Properties of the System. *BiznesInform, 7,* 93–97. Available at: https://business-inform.net/export_pdf/business-inform-2013-7_0-pages-93_97.pdf Last accessed: 18.09.2024
2. Kalashnikova, S. (2016). *Rozvytok liderskoho potentsialu suchasnoho universytetu: osnovy ta instrumenty.* Kyiv: DP "NVTs "Priorytety", 44.
3. Kalashnikova, S. A. (2010). Sutnist liderstva yak vyshchoho evoliutsiinoho rivnia upravlinnia. *Nauka i osvita, 4-5,* 101–104. Available at: https://scienceandeducation.pdpu.edu.ua/doc/2010/4_5_2010/23.pdf Last accessed: 18.09.2024
4. Romanovskyi, O. H., Rieznik, S. M., Hura, T. V., Panfilov, Yu. I., Holoveshko, B. R., Bondarenko, V. V.; Romanovskyi, O. H. (Ed.) (2017). *Liderski yakosti v profesiinii diialnosti.* Kharkiv: FOP Panov A.M., 144.
5. Lutsenko, B. (2020). Essence and nature of leadership qualities. *Pedagogy of the Formation of a Creative Person in Higher and Secondary Schools, 1 (68),* 90–93. https://doi.org/10.32840/1992-5786.2020.68-1.18
6. Iatsenko, O. M., Horbunov, M. P. (2018). *Formuvannia liderskykh yakostei maibutnikh menedzheriv u protsesi profesiinoi pidhotovky.* Kharkiv, 250.
7. *HR4.0: Shaping People Strategies in the Fourth Industrial Revolution* (2019). World Economic Forum, 38. Available at: https://www.weforum.org/reports/hr4-0-shaping-people-strategies-in-the-fourth-industrial-revolution/ Last accessed: 18.09.2024
8. *The Business Return on Learning and Development* (2022). Deakin-Co, 51. Available at: https://www2.deloitte.com/content/dam/Deloitte/au/Documents/Economics/deloitte-au-dae-business-return-learning-development-070922.pdf Last accessed: 18.09.2024
9. Rudska, A. I. (2013). *Psykholohichni osoblyvosti liderstva v umovakh realizatsii sotsialnykh proektiv.* Extended abstract of PhD thesis.
10. Jacobsen, C. B., Bøgh Andersen, L. (2015). Is Leadership in the Eye of the Beholder? A Study of Intended and Perceived Leadership Practices and Organizational Performance. *Public Administration Review, 75 (6),* 829–841. https://doi.org/10.1111/puar.12380
11. Kize, K. (2023). *36 powerful leadership statistics [2022]: things all aspiring leaders should know.* Available at: https://www.zippia.com/advice/leadership-statistics/ Last accessed: 18.09.2024
12. Kellis, D. S., Ran, B. (2012). Modern leadership principles for public administration: time to move forward. *Journal of Public Affairs, 13 (1),* 130–141. https://doi.org/10.1002/pa.1453
13. Janinks, D. (1995). *On Becoming a Leader.* Cambridge, 12–18.
14. Miliaieva, V. R. (2014). Leadership potential's development during the formation of managerial competence of the heads of educational institutions. *Visnyk Natsionalnoi akademii Derzhavnoi prykordonnoi sluzhby Ukrainy. Pedahohichni nauky, 1,* 34–40.
15. *28 Leadership Stats 2024 [about Business and the Workplace].* Available at: https://thrivemyway.com/leadership-stats/ Last accessed: 18.09.2024
16. Shtyfurak, V. S., Kyrylenko, V. V., Loiko, L. S. (2008). *Osnovy uspishnoi upravlinskoi diialnosti: (psykhohihiienichnyi aspekt).* Vinnytsia, 194.
17. Ivanova, V. (2014). Problema liderstva v kolektyvi ditei doshkilnoho viku. *Naukovyi visnyk Uzhhorodskoho natsionalnoho universytetu. Seriia: Pedahohika. Sotsialna robota, 32,* 78–81. Available at: http://nbuv.gov.ua/UJRN/Nvuuped_2014_32_28 Last accessed: 18.09.2024

DOI: 10.15587/2706-5448.2024.314525

DEVELOPMENT OF MARKETING MODELS FOR ATTRACTING AND RETAINING CONSUMERS IN DIGITAL BRANDING

pages 25–28

Kateryna Yahelska, *Doctor of Economic Sciences, Professor, Department of Marketing, State University of Trade and Economics, Kyiv, Ukraine, ORCID: https://orcid.org/0000-0002-3760-003X*

Liubov Vasylyshyna, *PhD, Associate Professor, Department of Marketing, State University of Trade and Economics, Kyiv, Ukraine, e-mail: l.vasylyshyna@knute.edu.ua, ORCID: https://orcid.org/0000-0001-8025-7786*

The object of study is digital branding. The process of attracting and keeping consumers in digital branding is considered. The phenomenon of digital branding and the basic tools of its impact on consumers are investigated. The global trends in the development of media consumption at the present stage are substantiated. Transformational changes in the process of consumption, as a consequence, have been proven to be transition to the area. It is determined that in order to attract and maintain online consumers, brands should respond quickly and establish effective feedback. Accordingly, the important role of digital branding is indicated. As a basis for the development of a marketing model of consumer involvement and keeping in digital branding it is proposed to use the AIDA model. The marketing model is indicated that allows to monitor the actions of consumers, as well as to control communication processes. The stages of the AIDA model in digital branding are highlighted – visiting the site, moving the goods to the basket, registration and payment of order. AIDA strategic tools in digital branding are identified. It is necessary to use the conversion coefficient to determine the efficiency of each stage of the model. It is proposed to supplement the classic Aida model with two elements of Satisfaction (S) and Loyalty (L) by receiving AIDASL. An advanced model of impact on consumers in digital branding has been developed. This model coordinates the stages of the AIDASL model with the main stages of the purchase decision process. The practical importance of the developed model of consumer involvement and maintenance in digital branding will increase the attention, interest, desire and level of purchase. This, in turn, will create the preconditions for increasing conversion at each stage of consumer contact with an online store, increasing their satisfaction and loyalty.

Keywords: digital branding, digital media, consumer behavior, marketing communications, promotion, conversion.

References

1. Hrytseniuk, V. V., Rusnak, A. V., Nadtochii, I. I. (2019). The essence of branding and its role in enterprise competitiveness. *Efektyvna Ekonomika, 12.* https://doi.org/10.32702/2307-2105-2019.12.156
2. Samoday, V., Mashyna, Y., Kovtun, G. (2023). Methodological principles of brand creation. *Economy and Society, 47.* https://doi.org/10.32782/2524-0072/2023-47-3
3. Iankovets, T., Medvedieva, K. (2022). Digital branding of the enterprise in the complex of marketing communications. *Scientia fructuosa, 144 (4),* 72–83. https://doi.org/10.31617/1.2022(144)05
4. Dubovyk, N. (2024). Digital branding: innovative approaches in the context of the transformation of the Ukrainian market during the war. *Achievements of the Economy: Prospects and Innovations, 2.* https://doi.org/10.57125/econp.2024.01.29.05
5. Fayvishenko, D., Melnichenko, O., Yatsiuk, D. (2022). Transformation of the branding concept as a result of digital marketing development. *Ukrainian Journal of Applied Economics and Technology, 7 (2),* 91–98. https://doi.org/10.36887/2415-8453-2022-2-11
6. Lisun, Y. (2023). Digital marketing and branding of higher education in ukraine and european countries. *Bioeconomics and Agrarian Business, 14 (3),* 84–101. https://doi.org/10.31548/economics14(3).2023.073
7. Zakryzhevska, I., Nianko, V., Polishchuk, Y. (2024). Innovative digital branding strategies in ukrainian business: analysis and recommendations. *Economy and Society, 60.* https://doi.org/10.32782/2524-0072/2024-60-31

8. Yahelska, K., Vasylyshyna, L., Shkurov, Y. (2023). Development of information and communication technologies to study consumer behavior in the process of brand management. *Eastern-European Journal of Enterprise Technologies, 3 (13 (123))*, 34–41. https://doi.org/10.15587/1729-4061.2023.279615
9. Latyshev, K., Moroz, O., Bilyk, M. (2023). Model of implementation of the communication strategy of brands in the digital environment. *Herald of Khmelnytskyi National University. Economic Sciences, 318 (3)*, 186–191. https://doi.org/10.31891/2307-5740-2023-318-3-29
10. *V chomu poliahaie vazhlyvist mediinoi reklamy?* Available at: https://enigma.ua/articles/mediynaya-reklama
11. Yanchuk, T., Lyubinchak, K. (2022). Direct marketing in ukraine: main problems and development prospects. *Economy and Society, 43*. https://doi.org/10.32782/2524-0072/2022-43-80
12. Kapinus, L. (2022). Event marketing in the online market as a tool to influence consumer behavior. *Economic Scope, 180*, 128–133. https://doi.org/10.32782/2224-6282/180-20
13. *US Media Consumption 2021–2025*. Available at: https://www.oberlo.com/statistics/us-media-consumption
14. Guttmann, A. (2024). *Media usage in Europe – statistics & facts*. Available at: https://www.statista.com/topics/4039/media-usage-in-europe/#editorsPicks
15. *Media Consumption in Ukraine: Change in Media Needs and Defeat of Russian Propaganda* (2022). Available at: https://dif.org.ua/en/article/media-consumption-in-ukraine-change-in-media-needs-and-defeat-of-russian-propaganda
16. Drach, V. (2022). *Shcho take koefitsiient konversii ta yak yoho rozrakhuvaty?* Available at: https://project-seo.net/blog-uk/shcho-take-koeficient-konversii/
17. Iarova, A. (2024). *Shcho take voronka prodazhiv? Vyznachennia, etapy ta stratehii optymizatsii v ryteili*. Available at: https://esputnik.com/uk/blog/sho-take-voronka-prodazhiv-viznachennya-etapi-ta-strategiyi-optimizaciyi-v-ritejli
18. *5 stadii rishennia pro pokupku na saiti* (2018). Available at: https://webmaestro.com.ua/ua/blog/rishennia-kupyty/
19. Gharib, P. (2024). *2024 Global Media Consumption Statistics and Forecasts*. Available at: https://profiletree.com/global-media-consumption-statistics/

DEVELOPMENT OF PRODUCTIVE FORCES AND REGIONAL ECONOMY

DOI: 10.15587/2706-5448.2024.312875

ESTIMATION OF THE WORLD MARKET AND APPLICATION OF NANOMATERIALS IN THE AEROSPACE INDUSTRY

pages 29–41

Viktor Malyshev, *Doctor of Technical Science, Professor, Department of Fundamental and Medical and Preventive Disciplines, PrHEI "International European University", Kyiv, Ukraine, ORCID: https://orcid.org/0000-0003-2756-3236, e-mail: viktor.malyshev.igic@gmail.com*

Angelina Gab, *PhD, Associate Professor, Department of Fundamental and Medical and Preventive Disciplines, PrHEI "International European University", Kyiv, Ukraine, ORCID: https://orcid.org/0000-0003-3162-7159*

Viktoriia Kovalenko, *PhD, Associate Professor, Department of Fundamental and Medical and Preventive Disciplines, PrHEI "International European University", Kyiv, Ukraine, ORCID: https://orcid.org/0000-0001-8778-014X*

Yurii Lipskyi, *PhD, Associate Professor, Department of Marketing, Management and Public Administration, National Academy of Statistics, Accounting and Audit, Kyiv, Ukraine, ORCID: https://orcid.org/0009-0009-8483-5833*

Dmytro Shakhnin, *PhD, Associate Professor, Department of Fundamental and Medical and Preventive Disciplines, PrHEI "International European University", Kyiv, Ukraine, ORCID: https://orcid.org/0000-0001-9657-8621*

The object of the study is the global aerospace market status, segment analysis, dynamics, competition, and prospects. The methods of searching and analyzing literature data, summarizing, systematizing, and visualizing data with diagrams are used.

The aerospace industry is at the forefront of technological innovation and is constantly searching for new advanced materials to improve productivity, efficiency, and safety. The aerospace market encompassing the design, manufacture, and maintenance of aircrafts, space vehicles, and related systems. It includes the commercial and military sectors, as well as the space exploration field.

The world market of the aerospace industry was studied. Factors affecting the market positively and negatively were identified. According to the global aerospace market segmentation by vehicle types, the leading position in 2023 was occupied by the commercial aircrafts segment with a share of 63.4 %; by the vehicle size – by the narrow-body aircraft segment (72.4 %); by the end consumer – by the private sector segment (65.4 %); by operation – by manually operated aircrafts segment (79.4 %); and by geographic regions – by the North American segment (47.3 %). The main strategic trends and directions of the further aerospace market development are presented.

The world market of aerospace materials was studied. Factors affecting market dynamics are identified, and market challenges are highlighted. According to the world aerospace market segmentation by the materials types, the leading place in 2022 belonged to the composite materials segment with a share of 69 %; by the aircraft type – to the commercial aircrafts segment (51 %); and by geographical regions – to the European segment (35.0 %).

The trends of the sustainable aerospace industry development are summarized: modern aircraft design, use of sustainable aviation fuel, urban air mobility, modern traffic technology, and air transportation management optimization. For each trend, possible actions leading to changes in the aerospace industry are considered.

The question of the nanomaterials use in the space industry is considered. Some characteristics and possibilities of application of nanocomposite materials, nanocoatings, nanofluids, nanosensors, and carbon nanotubes, as well as examples of the nanomaterials application in aircraft components are given. The industry problems are identified, and their possible solutions are given.

Keywords: aerospace market, aerospace materials market, market segmentation, market trends, market limitations, market development directions, nanomaterials.

References

1. Yang, P. (2023). Nanomaterials in Aerospace: Advancements, Applications, and the Path Forward. *Highlights in Science, Engineering and Technology, 73*, 116–121. https://doi.org/10.54097/hset.v73i.12847
2. Baig, N., Kammakakam, I., Falath, W. (2021). Nanomaterials: a review of synthesis methods, properties, recent progress, and challenges. *Materials Advances, 2 (6)*, 1821–1871. https://doi.org/10.1039/d0ma00807a

3. Malyshev, V., Gab, A., Kovalenko, V., Pryshedko, O., Shakhnin, D. (2024). Estimation of global nanomedicine market: status, segment analysis, dynamics, competition and prospects. *Technology Audit and Production Reserves, 1 (4 (75))*, 48–59. https://doi.org/10.15587/2706-5448.2024.299271
4. Udovytska, Ye. A. (2017). Mizhnarodne spivrobitnytstvo v aerokosmichnii sferi. *Naukovyi ohliad, 5 (37)*, 38–47. Available at: https://naukajournal.org/index.php/naukajournal/article/view/1210
5. *Aerospace Global Market Opportunities and Strategies to 2033* (2024). The Business Research Company, 367. Available at: https://www.researchandmarkets.com/report/commercial-aerospace
6. *Aerospace Market Size, Share, and Trends 2024 to 2034* (2024). Available at: https://www.precedenceresearch.com/aerospace-market
7. *Aerospace Materials Market Size, Share, and Trends 2024 to 2034 (2023)*. Available at: https://www.precedenceresearch.com/aerospace-materials-market
8. Pandian, G., Pecht, M., Zio, E., Hodkiewicz, M. (2020). Data-driven reliability analysis of Boeing 787 Dreamliner. *Chinese Journal of Aeronautics, 33 (7)*, 1969–1979. https://doi.org/10.1016/j.cja.2020.02.003
9. Hussain, M. S., Swailem, S. A., Hala, A. (2009). Advanced nanocomposites for high temperature aero-engine/turbine components. *International Journal of Nanomanufacturing, 4 (1-4)*, 248–256. https://doi.org/10.1504/ijnm.2009.028132
10. Liang, F., Tang, Y., Gou, J., Gu, H. C., Song, G. (2009). Multifunctional Nanocomposites With High Damping Performance for Aerospace Structures. *Volume 11: Mechanics of Solids, Structures and Fluids*, 267–273. https://doi.org/10.1115/imece2009-12542
11. Pavlenko, V. I., Cherkashina, N. I., Zaitsev, S. V. (2019). Fabrication and characterization of nanocomposite films Al, Cu/Al and Cr/Al formed on polyimide substrate. *Acta Astronautica, 160*, 489–498. https://doi.org/10.1016/j.actaastro.2019.02.025
12. Bhat, A., Budholiya, S., Aravind Raj, S., Sultan, M. T. H., Hui, D., Md Shah, A. U., Safri, S. N. A. (2021). Review on nanocomposites based on aerospace applications. *Nanotechnology Reviews, 10 (1)*, 237–253. https://doi.org/10.1515/ntrev-2021-0018
13. Xu, Y., Hoa, S. V. (2008). Mechanical properties of carbon fiber reinforced epoxy/clay nanocomposites. *Composites Science and Technology, 68 (3-4)*, 854–861. https://doi.org/10.1016/j.compscitech.2007.08.013
14. Mostafa, N. H., Ismarrubie, Z. N., Sapuan, S. M., Sultan, M. T. H. (2017). Fibre prestressed composites: Theoretical and numerical modelling of unidirectional and plain-weave fibre reinforcement forms. *Composite Structures, 159*, 410–423. https://doi.org/10.1016/j.compstruct.2016.09.090
15. Heidari, M., Thangavel, S., Ghafri, K. A., Kumar, A. (2024). Future trends and emerging research in nanofluids for aerospace applications. *Nanofluids Technology for Thermal Sciences and Engineering*. Boca Raton: CRC Press, 272–291. https://doi.org/10.1201/9781003494454-15
16. Kostopoulos, V., Masouras, A., Baltopoulos, A., Vavouliotis, A., Sotiriadis, G., Pambaguian, L. (2016). A critical review of nanotechnologies for composite aerospace structures. *CEAS Space Journal, 9 (1)*, 35–57. https://doi.org/10.1007/s12567-016-0123-7
17. Gohardani, O., Elola, M. C., Elizetxea, C. (2014). Potential and prospective implementation of carbon nanotubes on next generation aircraft and space vehicles: A review of current and expected applications in aerospace sciences. *Progress in Aerospace Sciences, 70*, 42–68. https://doi.org/10.1016/j.paerosci.2014.05.002
18. Baughman, R. H., Zakhidov, A. A., de Heer, W. A. (2002). Carbon Nanotubes – the Route Toward Applications. *Science, 297 (5582)*, 787–792. https://doi.org/10.1126/science.1060928

DOI: 10.15587/2706-5448.2024.314545

STATE POLICY ON PROVISION OF STRATEGIC STOCKS OF PETROLEUM PRODUCTS IN THE STRUCTURE OF THE STATE RESERVE

pages 42–48

Oleh Chechel, *Doctor of Science in Public Administration, Associate Professor, Department of Management and Administration, Open International University of Human Development "Ukraine", Kyiv, Ukraine, e-mail: zedat@ukr.net, ORCID: https://orcid.org/0000-0002-5092-9593*

Alla Bashuk, *Doctor of Social Communication, Associate Professor, Department of Advertising and Public Relations, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine, ORCID: https://orcid.org/0000-0001-5535-8999*

The object of research is the state policy on provision of strategic stocks of petroleum products in the structure of the state reserve. The article defines the importance of reserving for ensuring the strategic needs of the state in the state reserve system of Ukraine of such resources as oil, petroleum products, fuel and lubricants. There were established the factors of influence that require the transformation of approaches to the formatting the state reserve of strategic materials. It was proved the need to create a special model of state management of petroleum products, fuel and lubricant reserves in the structure of the state reserve. It was disclosed the peculiarity of the functioning of the oil transportation and storage market as an alternative to the state reserve system as for Ukraine. It was made an analysis of the Ukrainian legislation regarding the formation of the strategic reserve of oil and petroleum products. It was investigated the foreign experience of state policy in the field of reserving strategic reserves of oil and petroleum products. There were explored the ways of revealing the potential of legal adjusting of the processes of forming the strategic state reserve in Ukraine. There were developed the directions for improving the state policy in Ukraine regarding the formation of reserves of petroleum products based on the example of foreign countries. It was proved the expediency of expanding various forms of involvement of private sector entities in the processes of forming the state strategic reserve. There were determined the peculiarities of the model of interaction between the state and the private sector in this matter. There were prognosed further trends in the development of the global oil and oil products storage market. There were identified the potential opportunities for expanding Ukraine's participation in the global oil and oil products storage market. It was disclosed the mechanisms of state participation in the process of forming strategic reserves of oil and oil products in foreign countries. There were also determined the further need for the formation of the Ukrainian market for the storage of oil and oil products as an element of the state reserve system.

Keywords: special model of state management, state reserve, strategic reserves, oil storage market, logistics capacity.

References

1. Vlček, T., Černoch, F. (2013). Aktuální témata a projekty v oblasti skladování a dopravy ropy do ČR. *Paliva, 5 (1)*, 1–6. https://doi.org/10.35933/paliva.2013.01.01
2. Weiner, C. (2017). Managing Energy Supply Security and Gas Diversification in Hungary: Putting Theory into Practice. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3214556
3. Shentov, O., Stefanov, R., Vladimirov, M. (Eds.) (2019). *The Russian Economic Grip on Central and Eastern Europe*. New York: Routledge, 258. https://doi.org/10.4324/9781351109390

4. Ladislaw, S. (2015). *Modernization of the strategic petroleum reserve and related energy security considerations*. Center for Strategic and International Studies (CSIS), 15.
5. Gerberding, J. (2020). *The Role of the Strategic National Stockpile in Pandemic Response*. CSIS, 4. Available at: https://www.jstor.org/stable/resrep37522
6. Prakhar, J., Marpu, V., Eswara, P. (2021). *Oil Storage Market Outlook – 2030: Report Global Opportunity Analysis and Industry Forecast, 2021–2030*. Storage and Distribution, 260. Available at: https://www.alliedmarketresearch.com/oil-storage-market
7. Jirušek, M., Vlček, T., Koďousková, H., Robinson, R. W., Leshchenko, A., Černoch, F. et al. (2015). *Energy Security in Central and Eastern Europe and the Operations of Russian State-Owned Energy Enterprises*. Brno: Masaryk University, 702. https://doi.org/10.5817/cz.muni.m210-8048-2015
8. *Pro derzhavnyi materialnyi rezerv* (1997). Zakon Ukrainy No. 51/97-VR. 24.01.1997. Available at: https://zakon.rada.gov.ua/laws/show/51/97-%D0%B2%D1%80#Text
9. *Pro zatverdzhennia Poriadku formuvannia, rozmishchennia ta provedennia operatsii z materialnymy tsinnostiamy derzhavnoho rezervu* (1997). Postanova Kabinetu Ministriv Ukrainy No. 1129. 08.10.1997. Available at: https://zakon.rada.gov.ua/laws/show/1129-97-%D0%BF#Text
10. *Zatverdzhennia Instruktsii pro poriadok pryimannia, transportuvannia, zberihannia, vidpusku ta obliku nafty i naftoproduktiv na pidpryiemstvakh i v orhanizatsiiakh Ukrainy* (2008). Nakaz Ministerstva palyva ta enerhetyky Ukrainy, Ministerstva ekonomiky Ukrainy, Ministerstva transportu ta zviazku Ukrainy, Derzhavnoho komitetu Ukrainy z pytan tekhnichnoho rehuliuvannia ta spozhyvchoi polityky No. 281/171/578/155. 20.05.2008. Available at: https://zakon.rada.gov.ua/laws/show/z0805-08#Text
11. Vlček, T., Černoch, F. (2013). *The energy sector and energypolicy of the Czech Republic*. Brno: Masarykova univerzita, 252.
12. *Législation stockage*. Available at: https://www.cuvefioul.fr/legislation-stockage#cuve_l%C3%A9gislation_chauffage_avec_pompe
13. *Arrêté du 1er juillet 2004 fixant les règles techniques et de sécurité applicables au stockage de produits pétroliers dans les lieux non visés par la législation des installations classées ni la réglementation des établissements recevant du public* (2004). Available at: https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000437731/
14. *Règlement sur les systèmes de stockage de produits pétroliers et de produits apparentés DORS/2008-197*. Available at: https://laws-lois.justice.gc.ca/fra/reglements/DORS-2008-197/TexteComplet.html?wbdisable=false
15. *Réservoirs de stockage des produits pétroliers*. Available at: https://www2.gnb.ca/content/gnb/fr/ministeres/egl/environnement/content/terre_et_dechets/content/guide_de_consultation/petroliers.html

DOI: 10.15587/2706-5448.2024.314539

IMPROVING THE TECHNOLOGY TRANSFER IN UKRAINE UNDER THE CONDITIONS OF IMPLEMENTING THE INTERNATIONAL POLICY OF SUSTAINABLE DEVELOPMENT

pages 49–52

Oleksandr Davydiuk, *PhD, Associate Professor, Department of Business Law, Yaroslav Mudryi National Law University, Kharkiv, Ukraine, e-mail: aleksandr.daviduk@gmail.com, ORCID: https://orcid.org/0000-0002-6699-0903*

The object of this research is a set of management and regulatory methods of state influence on the technology transfer of Ukraine in the context of the implementation of the global model of sustainable development policy. Methods and techniques of public regulation of technology transfer in Ukraine and its compliance with the requirements of sustainable development are studied. The analysis and generalization of the existing world and international approaches to the definition of sustainable development policy established that technology transfer is one of the key objects of managerial influence. It has been proven that the existing regulatory model of technology transfer in Ukraine, formed without taking into account the goals of sustainable development, does not meet its strategic development objectives. The expediency of improving the existing concept of regulation and management of technology transfer in Ukraine in order to eliminate the identified inconsistencies is substantiated. Recommendations have been made regarding directions for improving regulatory and management approaches to determining technology transfer in Ukraine. The necessity of making changes to the provisions of the Law of Ukraine "On State Regulation of Activities in the Field of Technology Transfer" has been proved, with the aim of bringing it into line with the international policy of sustainable development.

The research is aimed at the formation of general theoretical foundations for the improvement of managerial and regulatory methods of technology transfer in Ukraine. The research results can be used in the improvement of public rules of technology transfer, the formation of strategic public management decisions, state technological policy and serve as a basis for further scientific research on these issues. The conclusions obtained in the course of this research can be used to solve issues and problems of improving the current legislation of Ukraine to the requirements of international agreements and documents.

Keywords: technology regulation, forms of technology transfer, unification of transfer forms, state technology policy.

References

1. Tomashuk, I., Tomchuk, O., Girenko, Y. (2021). Development of international economic relations in the conditions of globalization. *Economy. Finances. Management: Topical Issues of Science and Practical Activity, 2 (56)*, 197–212. https://doi.org/10.37128/2411-4413-2021-2-14
2. *Pro derzhavne rehuliuvannia diialnosti u sferi transferu tekhnolohii* (2006). Zakon Ukrainy No. 143-V 14.09.2006. Available at: https://zakon.rada.gov.ua/laws/show/143-16#n398;
3. *Measures for protecting and enhancing the environment* (1972). UUN. The General Assembly. A/PV.2112. 15.12.1972. 117-0-10. Available at: https://undocs.org/A/RES/3000(XXVII)
4. *Etapy vynyknennia ta stanovlennia kontseptsii zbalansovanoho rozvytku*. Stalyi rozvytok dlia Ukrainy. Available at: https://dev.sd4ua.org/shho-take-stalij-rozvitok/istoriya/
5. *Transforming our world: the 2030 Agenda for Sustainable Development. UUN*. The General Assembly. A/70/PV.4 25 September 2015. GA/11688. Available at: https://undocs.org/A/RES/70/1
6. Perga, T. (2017). Sustainable Development in the New Members of the EU. *European Historical Studies, 6*, 48–63. https://doi.org/10.17721/2524-048x.2017.06.48-63
7. EUROPE 2020. *A strategy for smart, sustainable and inclusive growth*. Available at: http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf
8. Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013 (Text with EEA relevance) (2021). *Official Journal of the European Union, 12.5.2021*. Available at: https://eur-lex.europa.eu/eli/reg/2021/695

9. Davydiuk, O., Duiunova, T., Shovkoplias, H., Sivash, O., Hlushchenko, S., Lisohorova, K., Maryniv, I. (2023). Directions for improving the international legal regulation of the support program for the transfer of innovations and technologies & Horizon Europe. *Eastern-European Journal of Enterprise Technologies, 2 (13 (122)*, 85–91. https://doi.org/10.15587/1729-4061.2023.276747
10. *Pro Kontseptsiiu staloho rozvytku naselenykh punktiv* (1999). Postanova Verkhovnoi Rady Ukrainy No. 1359-XIV. 24.12.1999. Available at: https://zakon.rada.gov.ua/laws/show/1359-14#Text
11. *Kompleksna prohrama realizatsii na natsionalnomu rivni rishen, pryiniatykh na Vsesvitnomu samiti zi staloho rozvytku, na 2003–2015 roky* (2003). Postanova Kabinetu Ministriv Ukrainy No. 634. 26.04.2003. Available at: https://zakon.rada.gov.ua/laws/show/634-2003-%D0%BF#Text
12. *Stratehiia rozvytku sfery innovatsiinoi diialnosti na period do 2030 roku* (2019). Rozporiadzhennia Kabinetu Ministriv Ukrainy No. 526-R. 10.07.2019. Available at: https://zakon.rada.gov.ua/laws/show/526-2019-%D1%80#Text