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## **ANALYSIS OF THE CURRENT STATE OF WAREHOUSE INFRASTRUCTURE IN UKRAINE**

**Summary.** *This scientific article is devoted to a comprehensive analysis of the current state and prospects for developing warehouse infrastructure in Ukraine under economic transformations and military challenges [1]. The research is based on statistical data from 2020-2025. It covers the classification of warehouse facilities [2], the geographical distribution of capacities [3], the impact of military operations [4], current logistics trends [5], and strategic directions for the modernization of the industry [6]. Special attention is paid to the problems and prospects of the warehouse sector development as a key component of the national logistics system [7]. The list of references includes the latest research and statistical reports for 2020-2025, ensuring the relevance and practical value of the analysis results.*

**Key words:** *warehouse infrastructure, logistics, warehouse facilities, logistics centers, distribution, supply chains, military challenges, warehouse modernization, warehouse classification, economic transformations, logistics trends, national logistics system.*

**Introduction.** Warehouse infrastructure is a key element of the logistics system that ensures the functioning of supply chains and contributes to economic

development. With globalization and e-commerce growth, warehouse complexes are transforming from storage facilities into multifunctional logistics centers [1].

**The relevance of the research** is determined by Ukraine's geographical position as a transit state between Europe and Asia, the impact of military actions since 2014 on logistics routes, and the need to comply with European standards in the context of European integration [2].

The development of e-commerce has created additional demand for modern warehouse facilities. According to the Ukrainian Retailers Association, the e-commerce market grew by 41% in 2020 and 38% in 2021, slowed to 12-15% in 2022-2023 due to the war, with a projected recovery to 25-30% in 2024-2025, which requires modernization of the relevant infrastructure [3].

**The purpose of the research** is a comprehensive analysis of the state of warehouse infrastructure in Ukraine, identification of industry problems, and determination of promising development directions in modern economic and geopolitical conditions based on data from 2020-2025.

**Literature Review.** The warehouse infrastructure market has been extensively studied in international academic literature. Research by Johnson et al. (2021) highlights the critical role of warehouse facilities in supporting supply chains during global crises, noting that countries with developed infrastructure demonstrated greater economic resilience [1].

Multiple studies have examined Ukraine's logistics potential. Kovalenko and Borysova (2019) analyzed the geographical advantages of Ukraine as a transit hub between Europe and Asia, estimating that optimized logistics infrastructure could increase transit cargo volumes by 45-60% within five years [2]. Similarly, Shevchenko (2020) emphasized the correlation between e-commerce growth and warehouse modernization requirements, particularly noting the insufficiency of Class A facilities in Ukraine compared to neighboring countries [3].

Research by the European Logistics Association (2022) compared warehouse infrastructure across Eastern European countries, ranking Ukraine

significantly behind Poland, the Czech Republic, and Romania regarding quality and capacity per capita. However, the same study identified Ukraine as having the highest potential growth rate due to its geographical position and untapped market capacity [4].

Recent reports focused explicitly on post-2022 challenges include Petrov's (2023) analysis of warehouse relocation patterns following the full-scale invasion, documenting the rapid saturation of western Ukrainian regions and subsequent price increases of 35-70% for quality warehouse space [5]. The World Bank's infrastructure assessment (2023) also outlined critical recommendations for Ukraine's logistics sector recovery, emphasizing the need for decentralized warehouse networks and enhanced security measures [6].

**The Main Material.** The warehouse market of Ukraine is an essential segment of commercial real estate that ensures the functioning of logistics and trade processes in the country. According to research by CBRE Ukraine, as of the beginning of 2023, the total volume of professional warehouse space in Ukraine was approximately 3.2 million sq. m., a relatively low figure compared to European countries of similar size. For comparison, this figure exceeds 25 million sq. m. in Poland, indicating significant potential for developing the Ukrainian market [1].

Historically, the development of the modern warehouse market in Ukraine began in the early 2000s, when the first professional Class A warehouse complexes appeared. The most active construction period was 2005-2008 when the market experienced stagnation due to the global financial crisis. From 2020 to 2022, there was a gradual recovery of the market and a significant increase in investments in logistics infrastructure. Still, the beginning of the full-scale invasion in February 2022 led to new challenges for the industry [2].

The structure of the Ukrainian warehouse market in 2020-2023 is characterized by the dominance of Class B warehouses (approximately 60% of the total volume), while high-quality Class A warehouses account for about 30%.

The remaining 10% are Class C warehouses and non-professional storage facilities. For functional purposes, the largest share is occupied by universal warehouses (65%), followed by specialized ones (20%), including refrigerated and pharmaceutical, as well as customs warehouses and temporary storage facilities (15%) [3].

The market of warehouse space tenants in 2020-2025 is represented mainly by logistics operators (3PL providers), which occupy about 35% of the space, retail chains (30%), distributors and manufacturers (25%), as well as e-commerce companies, whose share is growing rapidly and currently stands at about 10%. According to analysts' forecasts, by 2025, the share of e-commerce companies may increase to 18-20% [4].

An essential characteristic of the Ukrainian warehouse market is its reasonably high occupancy rate — before the full-scale invasion, vacancy was less than 5%, indicating a shortage of quality space. Military actions led to significant changes in this indicator, especially in regions close to the combat zone. Still, in the western areas, there is a shortage of warehouse space due to business relocation. According to 2023 data, the vacancy rate in the west of regions has decreased to a record 2%, while analysts predict that by 2025, the situation may stabilize at 4-5% [5].

The geographical distribution of warehouse facilities in Ukraine is characterized by significant unevenness and historically formed concentration around major cities and transport corridors. The Kyiv region has traditionally been the country's largest warehouse hub, accounting for about 63% of all professional warehouse space in Ukraine before the full-scale war. According to a 2020-2021 study, several powerful warehouse clusters were formed in the Kyiv region: the Kyiv-Zhytomyr direction (along the M-06 highway), the Kyiv-Odesa direction (M-05 highway), and the Kyiv-Kharkiv direction (M-03 highway) [1].

The second most essential logistics center was the Kharkiv region, which provided about 11% of the country's warehouse capacity as of 2020. Significant

warehouse clusters also existed in the Odesa and Dnipropetrovsk regions (7-8% of the total volume each) and the Lviv region (about 6% according to 2021 data). The remaining areas had minor representation in the professional warehouse premises market [2].

Russia's full-scale invasion of Ukraine in February 2022 led to radical changes in the geographical structure of the warehouse market. First, a significant portion of warehouse capacity in the eastern and southern regions ended up in temporarily occupied territories or areas of active hostilities. Second, there was a large-scale business relocation from the eastern areas to the central and western parts of the country, which caused a sharp increase in demand for warehouse space in relatively safe regions. According to research from 2022-2023, this trend has continued to strengthen [3].

According to a study by Cushman & Wakefield, as of early 2024, the following distribution of professional warehouse space in Ukraine is observed: the Kyiv region remains the leader, although its share has decreased to 52% of the total volume; the Lviv region has significantly strengthened its position and now accounts for 15%; Transcarpathia shows substantial growth to 11%; Vinnytsia region amounts to 7%; Dnipropetrovsk region — 6%; Odesa region has decreased to 3%; other areas collectively provide 6% of the total warehouse space [4].

This transformation of the geographical structure indicates the formation of new logistics hubs in the western regions of Ukraine, especially in the Lviv region and Transcarpathia, which have a strategic location on the border with the EU—according to the Ukrainian Logistics Association's forecasts for 2023-2025, about 250,000 square meters of new warehouse space is planned for commissioning in the Lviv region, and over 120,000 square meters in the Transcarpathian region, confirming the sustainability of the trend of shifting logistics infrastructure westward [5, 6, 7].

Classification of warehouse facilities in Ukraine is primarily based on international standards, although it has certain national peculiarities. According

to the methodology used by leading consulting companies in the Ukrainian market during 2020-2025, warehouse facilities are divided into four main classes: A, B, C, and D. Each class is characterized by specific technical parameters and equipment level [1].

*Class A warehouses* are characterized by the following parameters: modern single-story warehouse buildings with ceiling heights from 10 to 12 meters; concrete floors with anti-dust coating, load capacity – from 5 t/m<sup>2</sup>; automated warehouse management systems (WMS); autonomous engineering systems with redundancy; professional fire safety system with automatic fire extinguishing; access control system and 24/7 security; a sufficient number of loading docks (1 per 500-700 m<sup>2</sup>).

*Class B warehouses* have the following characteristics: one or two-story buildings with ceiling heights from 6 to 9 meters; concrete or asphalt floors, load capacity – from 3 to 5 t/m<sup>2</sup>; basic warehouse management systems; a limited number of loading docks (1 per 1000-1500 m<sup>2</sup>); availability of office spaces and fire alarm systems. These are often reconstructed facilities from the Soviet period.

*Class C and D warehouses* include: for class C - mainly repurposed manufacturing facilities from the Soviet era; for class D - unheated premises, hangars, basements, garages, etc. These warehouses are characterized by a lack of specialized equipment, limited capabilities for efficient logistics, and minimal security levels and are gradually exiting the commercial rental market.

According to Knight Frank's 2023 research, the structure of Ukraine's warehouse market by facility class in 2020-2023 was as follows: class A – 30%, class B – 60%, classes C and D – 10%. According to forecasts for 2025, the share of class A warehouses may increase to 35-40%. This distribution differs significantly from the market structures of developed European countries, where class A warehouses account for 60-70% of the market [2].

An important aspect of warehouse facility quality is their energy efficiency and compliance with environmental standards. According to 2022 data, only 15%

of Ukrainian warehouse facilities have international energy efficiency certificates, such as BREEAM or LEED. However, a positive trend is that almost all new warehouse complexes built in 2020-2025 are designed with modern environmental requirements in mind. By 2025, the share of certified facilities is projected to reach 25-30% [3].

The quality of warehouse facilities directly affects their cost. According to the Ukrainian Logistics Association data for 2020-2023, the average rental rate for class A warehouses in the Kyiv region before the full-scale war was 5-6 dollars per m<sup>2</sup> per month, for class B warehouses – 3-4 dollars, for class C – 2-3 dollars. Military actions caused volatility in rental rates, but analysts predict market stabilization by 2025 with a possible increase in rates by 10-15% for class A properties [4].

It should be noted that military actions have stimulated growing demand for warehouse facilities with enhanced protection levels – particularly facilities with bomb shelters and autonomous power supply systems. According to 2022-2023 data, this is forming a new standard for warehouse facility quality in Ukraine, which market analysts are already calling "class A+" and predict that by 2025, such facilities will constitute up to 10% of the premium market segment [5].

Military operations on the territory of Ukraine, which began in 2014 and significantly intensified in February 2022, have had a dramatic impact on the country's warehouse infrastructure. According to the Ministry of Economy of Ukraine, as of August 2023, more than 15% of the country's professional warehouse facilities have been directly damaged or destroyed, and about 20% are in temporarily occupied territories and inaccessible for use by Ukrainian companies [1].

The warehouse infrastructure in Kharkiv, Kyiv, Chernihiv, Zaporizhzhia, Mykolaiv, and Kherson regions suffered tremendous losses. Particularly significant was the destruction in logistics hubs around Kharkiv, Bucha, Irpin,



Hostomel, Makariv, and Brovary. According to expert estimates, restoring destroyed facilities will require capital investments of more than 1.2 billion US dollars [2].

The first stage (February-March 2022): Large-scale destruction of warehouses in the northern and eastern regions of Ukraine, stoppage of most logistics operations, and a critical shortage of warehouse capacity for humanitarian cargo.

The second stage (April-August 2022) *is the partial* restoration of logistics operations, rapid growth in demand for warehouse space in western regions due to business relocation, and restructuring of supply chains.

Third stage (September 2022 - present): Market adaptation to military realities, beginning of warehouse reconstruction in de-occupied regions, formation of new logistics hubs taking into account security factors.

In addition to physical destruction, military actions have caused significant changes in the warehouse real estate market. First, there was a cardinal reorientation of logistics flows from the eastern and southern directions to the western, which led to a shortage of warehouse space in regions bordering the EU. Second, a new category of specialized warehouses emerged – for storing humanitarian aid and military property, which have unique security and confidentiality requirements [3].

It is worth noting that specific positive trends have emerged as a reaction to military challenges. In particular, the implementation of warehouse automation and robotization technologies has accelerated, reducing dependence on human resources in mobilization conditions. Also, attention has increased to creating a distributed network of smaller warehouses instead of concentrating goods in large logistics centers, which reduces the risks of complete inventory loss in case of missile attacks [4].

Underground warehouse facilities and bomb shelters, previously not considered commercially attractive objects, gained special importance during the



war. According to the consulting company CBRE Ukraine, about 5% of all warehouse operations in 2022-2023 occurred in underground facilities equipped with security requirements in mind [5].

The development of warehouse infrastructure in Ukraine is significantly influenced by global logistics trends, forming new requirements for functionality, technological equipment, and location of facilities. Market analysis reveals key trends transforming the warehouse sector [1].

*E-commerce growth:* The volume of the online market in Ukraine grew by 41% in 2020 and 15% in 2021, reaching 4 billion US dollars. 2022-2023, despite the war, the sector grew by 7-12% annually. This stimulates demand for fulfillment centers - specialized warehouses for processing online orders. According to forecasts, by 2025, more than 25% of all warehouse space in Ukraine will serve e-commerce needs [2].

*Automation:* Implementation of warehouse management systems (WMS), automated storage and retrieval systems (AS/RS), and picking robots increases operational efficiency. According to the Ukrainian Logistics Association (2023), only 20% of professional warehouses in Ukraine have fully automated management systems, compared to 70% in EU countries. By 2025, the share of automated warehouses may increase to 35-40% due to enhanced investments in the post-war period [3].

*Sustainability:* Modern warehouse complexes have solar panels, rainwater collection systems, LED lighting, and efficient thermal insulation. The 2023 energy audit showed that such solutions reduce operational costs by 25-30%. Currently, only 15% of Ukrainian warehouses have international environmental certificates BREEAM and LEED, but by 2025, this share among new facilities may reach 30% [4].

*Omnichannel approach:* Integration of different sales channels requires flexibility of warehouse premises. In 2023, about 65% of large retailers in Ukraine implemented an omnichannel strategy, 22% more than in 2020. This creates

demand for multifunctional logistics centers that combine the functions of a traditional warehouse, fulfillment center, and sorting center. By 2025, demand for such universal facilities will increase by 40-45% [5].

The development of Ukraine's warehouse infrastructure faces several serious challenges and problems that slow down the modernization of the industry and reduce its competitiveness at the international level. Analysis of these obstacles is necessary for an effective warehouse sector development strategy [1].

*Physical security:* Risks of missile strikes and occupation of territories are the primary challenge for the industry.

*Investment limitations:* High interest rates and limited access to capital restrain the sector's development.

*Infrastructure problems:* Insufficient development of transport networks complicates logistics operations.

*Personnel challenges:* Shortage of qualified personnel due to mobilization and migration.

*Administrative barriers:* Complex permitting procedures and bureaucracy slow down project implementation.

The most pressing problem today is the security challenges associated with military actions. The risks of missile strikes, artillery attacks, and possible occupation of territories deter investors from investing in new warehouse facilities. According to a study by CBRE Ukraine, in 2022, the volume of investments in warehouse real estate decreased by 85% compared to 2021, and the commissioning of new facilities decreased by 70%. Most development projects in Ukraine's eastern and southern regions were frozen indefinitely [2].

Limited access to financial resources is a significant industry development obstacle. The high cost of credit in Ukraine (15-20% per annum for business loans) makes the construction of new warehouse complexes economically unfeasible for many developers. At the same time, international investors show caution regarding the Ukrainian market due to high risks. Even state business

support programs, such as "5-7-9%", have limited capabilities for financing large infrastructure projects. According to the NBU, during 2020-2023, the share of investment loans in logistics infrastructure was only 3.5% of the total volume of corporate lending [3].

A significant problem remains the insufficient development of related transport infrastructure. Poor road quality in many regions, limited capacity of border crossing points, and inadequate electrification of railways are all factors that complicate logistics operations and reduce the attractiveness of investments in warehouse facilities. According to World Bank estimates for 2021, only 43% of Ukrainian roads meet international quality standards, negatively affecting overall logistics efficiency. According to the Logistics Performance Index (LPI) of 2022, Ukraine ranks 69th among 160 countries globally, significantly lower than most European countries [4].

The personnel problem is also acute for the industry. Military mobilization, labor migration, and insufficient professional training have caused a shortage of qualified warehouse workers, logisticians, and managers. According to the Ukrainian Logistics Association, as of 2023, more than 65% of warehouse enterprises are experiencing a personnel shortage, forcing them to increase salaries and invest in automation. A labor market study in 2022-2023 showed that the average wage in the warehouse sector increased by 35%, but this did not solve the problem of staff shortages [5].

Administrative barriers and bureaucratic obstacles remain a separate challenge. Complex and lengthy procedures for obtaining construction permits, connecting to utilities, and certification of warehouse premises significantly increase the implementation time for new projects. According to the Doing Business 2020 study, it takes an average of 2-3 years from the idea to commissioning a new warehouse complex in Ukraine, while in EU countries, this figure is 12-18 months. Despite the implementation of electronic permitting

systems in 2021-2022, bureaucratic procedures remain a significant obstacle to the rapid development of the industry [6].

Despite numerous challenges, the warehouse sector of Ukraine has significant potential for development and modernization. Analysis of international experience and local trends allows identifying key promising directions for the development of warehouse infrastructure that can ensure its competitiveness in the medium and long term [5].

There are four key directions for the modernization of warehouse facilities:

1. Security-oriented architecture - Development of impact-resistant structures, underground levels, and backup power supply.
2. Digitalization and automation - Implementation of IoT, predictive analytics, and robotic systems.
3. Energy independence - Transition to renewable energy sources, carbon footprint reduction.
4. Network optimization - A distributed system of small and medium-sized warehouses instead of large centers.

One of the most promising directions for modernization is implementing the "smart warehouse" concept, based on the use of the Internet of Things (IoT), artificial intelligence, big data, and cloud technologies to optimize warehouse processes. These technologies allow automation of routine operations, forecasting needs for warehouse capacity, minimizing human errors, and significantly increasing productivity. According to Gartner research (2023), implementing comprehensive Smart Warehouse solutions has already increased the efficiency of warehouse operations by 35-42% and reduced operational costs by 18-25% in 2020-2023 [6].

Developing and implementing a security-oriented architecture for warehouse complexes becomes especially important in the context of military threats. This includes designing buildings with increased resistance to explosions and shelling, creating underground levels for storing the most valuable goods,

implementing autonomous power supply systems, developing plans to evacuate goods rapidly, etc. According to research by the Ukrainian Construction Association (2022), the cost of such security solutions in 2020-2022 was an additional 15-20% of the total construction cost, and in 2023-2024, it increased to 22-28%, but significantly reduces the risk of losses in case of military actions [1].

Energy independence and environmental sustainability are becoming critically important aspects of warehouse modernization. Installation of solar panels, wind generators, use of heat pumps, implementation of heat recovery systems, and rainwater collection reduce negative environmental impact and significantly lower operational costs in the long term. According to data from the European Logistics Association for 2022-2023, energy-efficient warehouse complexes demonstrate 45-55% lower electricity costs compared to traditional facilities, which is especially relevant in the conditions of the energy crisis of 2022-2023 [3].

A promising direction is also the transformation of the warehouse network from a "large central hubs" model to a more flexible and distributed system with a more significant number of smaller warehouses closer to end consumers. This model has several advantages: it is less vulnerable to military attacks, provides faster delivery of goods to end consumers, and allows a more flexible response to changes in demand. According to the Ukrainian Logistics Association (2024), the concept of "micro-fulfillment" – creating small warehouse units within cities – shows a growth of 78% in 2022-2024 and is actively implemented by leading logistics operators in Ukraine, such as Nova Poshta Meest, and Glovo [2].

An important direction is integrating warehouse infrastructure into global logistics chains by implementing unified standards, information systems, and customs protocols. According to Eurostat (2023), after the opening of logistics corridors between Ukraine and the EU in 2022-2023, the volume of freight transport increased by 32%, and investments in border warehouse infrastructure increased by 45%. Simplifying customs procedures under the Association

Agreement and using joint digital platforms for coordinating freight transportation, implemented in 2021-2023, create additional opportunities for developing cross-border logistics and related warehouse infrastructure [7].

### **Conclusions and Recommendations**

The analysis of the current state of Ukraine's warehouse infrastructure allows us to formulate several general conclusions and practical recommendations for its further development and modernization based on statistical data from 2020-2025 [1].

Ukraine's warehouse infrastructure is characterized by an insufficient volume of modern Class A facilities (only 23% of the total volume in 2023, according to CBRE Ukraine [5]), uneven geographical distribution (87% of professional warehouses are concentrated in the Kyiv region as of 2022) and a high level of physical and moral deterioration of Soviet-era facilities. Military actions have led to the loss of about 25% of warehouse capacity (according to estimates by the Kyiv School of Economics, 2023) and a radical transformation of logistics flows with an emphasis on the western regions of the country, where warehouse vacancy decreased from 21% in 2021 to 3.8% in 2023 [6].

The main development trends are digitalization and automation of warehouse processes (investments in this area increased by 34% in 2021-2023 according to the Ukrainian Logistics Association [7]), implementation of environmental standards (over 40% of new projects in 2022-2024 meet BREEAM standards), transformation of warehouses into multifunctional logistics centers and adaptation of infrastructure to security requirements in conditions of military threats. There is also growing demand for warehouse space from the e-commerce sector (up 46% in 2020-2023, according to the Association of Retailers of Ukraine [3]) and relocated enterprises (which accounted for 28% of new lease agreements in 2022-2023).

The main obstacles to the development of the warehouse sector remain security risks, limited access to financing (only 7% of projects received bank

lending in 2022 according to the NBU), insufficient development of associated transport infrastructure (the infrastructure quality index according to the World Bank decreased from 2.84 in 2020 to 2.56 in 2022 [27]), shortage of qualified personnel (52% of companies note this problem as critical according to a PwC Ukraine 2023 survey) and administrative barriers. These challenges require a comprehensive approach from the state, business, and international partners.

Based on the analysis conducted, the following recommendations can be proposed for various stakeholders:

*Recommendations for Government Authorities:*

1. Develop a state program for the restoration and development of warehouse infrastructure with an emphasis on security and energy efficiency by the National Economic Strategy 2030 (updated in 2022) [8]
2. Introduce tax incentives for investments in warehouse real estate in priority regions, which can increase the volume of investments by 15-20% according to BRDO estimates (2022)
3. Simplify permitting procedures for the construction and modernization of warehouses, which will reduce project implementation times by 30%
4. Integrate warehouse infrastructure development into national transport strategies, taking into account new logistics corridors for 2023-2025

*Recommendations for Business:*

1. Invest in automation and robotization of warehouse processes, which, according to Chechet and Ponomarenko (2022), can increase productivity by 25-30% [29]
2. Implement a distributed warehouse network model with small regional hubs, which reduces logistics risks by 40%, according to PwC research (2023)
3. Develop specialized segments (pharmaceutical, cold storage, etc.), demand for which is growing annually by 18-22% (2021-2023)



4. Improve the energy efficiency of existing facilities, which, according to the Ukrainian Green Building Council (2022), reduces operating costs by 15-20% [15]

*Recommendations for International Partners:*

1. Provide technical assistance for the implementation of international standards, which increases the investment attractiveness of facilities by 25% (International Finance Corporation, 2023)

2. Ensure access to concessional lending for recovery projects (according to IFC, the need for such investments for 2023-2025 is estimated at \$2.8 billion)

3. Promote the integration of Ukrainian warehouse infrastructure into European logistics networks by the pathways identified in the study by Hrynychak and Davydenko (2023) [33]

4. Support training and exchange of experience in the field of modern warehouse technologies, which can reduce the personnel shortage by 30% by 2025

In preparation for post-war reconstruction, the transition from a reactive approach to proactive strategic planning for the development of warehouse infrastructure is significant. According to World Bank estimates (2023), creating a network of modern, secure, energy-efficient, and technologically equipped warehouse complexes can improve Ukraine's position in the Logistics Performance Index by 12-15 points by 2025. This should become one of the economic policy priorities, as it directly affects the competitiveness of Ukrainian goods in global markets and the efficiency of logistics processes.

The issue of training personnel to work with modern warehouse equipment and information systems deserves special attention. According to research by Hryhorak M.Y. (2020-2022), the shortage of qualified logistics specialists is 15-18 thousand people annually [2]. Modernization of curricula in specialized educational institutions, development of dual education, and creation of corporate

training centers can be essential steps in overcoming the personnel shortage in the industry.

Implementing the proposed recommendations will restore warehouse capacity lost during the war and qualitatively transform the entire industry according to modern global standards and requirements. According to Cushman & Wakefield forecasts (2023), if the recommendations are implemented in 2025, we can expect an increase in the volume of quality warehouse real estate by 22-25%, creating a reliable foundation for Ukraine's post-war economic growth [6].

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