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GREEN STANDARDS IN UKRAINE: CURRENT STATE OF THE PROBLEM

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Abstract. This article provides a comprehensive analysis of the current state of green standards implementation within Ukraine's construction industry. The study's relevance is underscored by global challenges, including climate change, natural resource depletion, and urbanization, which necessitate a transformative shift in the construction sector to achieve the Sustainable Development Goals (SDGs). Global practice consistently demonstrates the effectiveness of international certification systems such as LEED, BREEAM, and DGNB in reducing emissions, optimizing energy consumption, improving environmental quality, and fostering sustainable urban environments. However, despite isolated positive examples, the widespread adoption of these standards in Ukraine remains limited. This is primarily due to the absence of a comprehensive national "green" standard, one that is fully adapted to local conditions and effectively integrated into the state regulatory framework. While Ukraine's existing regulatory and legal framework contains fragmented provisions concerning energy efficiency and ecological design, it currently lacks a cohesive, systemic approach to green architectural practices. Particular attention is drawn to the imperative of adapting international best practices to Ukraine's specific socio-economic conditions and regional characteristics.

The research employed a comprehensive methodological approach. This encompassed a systematic analysis of Ukraine's regulatory framework pertaining to ecological construction, a comparative analysis of leading international green standards (LEED, BREEAM, DGNB) and their correlation with the United Nations Sustainable Development Goals, and an empirical analysis of the market for ecologically certified buildings in Ukraine as of April 2025.

The findings indicate that Ukraine has established a foundational regulatory framework that addresses certain aspects of ecological building certification, particularly in areas like thermal insulation, energy efficiency, and resource metering. A review of relevant laws, state building norms (DBNs), and ministerial orders confirms the government's aspiration to integrate sustainable development principles. Furthermore, international green standards (LEED, BREEAM, DGNB) demonstrate a high degree of alignment with the SDGs, encompassing their environmental, social, and economic dimensions. The analysis of the market for certified properties revealed a limited number of completed projects (only a few dozen), predominantly concentrated within the public and office building segments in major cities, while the residential sector remains largely untouched by "green" certification.

The study confirms the existence of significant challenges, yet simultaneously highlights substantial potential for the advancement of green building in Ukraine. There is a clear need for the development of a holistic national green standard specifically tailored to Ukrainian peculiarities. Additionally, the establishment of a unified national register for certified buildings is crucial for data systematization and promoting ecological standards among developers and the general public. The systemic implementation of green standards in Ukraine must be grounded in a robust legislative framework, the integration of international experience, adherence to SDGs, and scientifically substantiated adaptation to the national context.

Future research will focus on developing a template for a national green standard that accounts for regional specificities and incorporates the visual and aesthetic qualities of architecture into its criteria.

Keywords: green standards, LEED, BREEAM, DGNB, ecological certification, sustainable development, Sustainable Development Goals.

Introduction. In the context of global challenges related to climate change, rapid urbanization, and depletion of natural resources, the construction industry stands out as one of the key sectors capable of significantly contributing to the achievement of sustainable development goals. International experience has shown that the implementation of green standards – certification systems that address environmental, economic, and social aspects of construction – is an effective tool for reducing carbon emissions, optimizing energy consumption, improving quality of life, and promoting the ecological transformation of urban environments. Among the most widely recognized global certification systems are LEED (USA), BREEAM (United Kingdom), and DGNB (Germany), which are gradually gaining traction in Ukraine as well. However, despite successful case studies, the scale of green certification adoption at the national level remains limited.

One of the key problems is the absence of a comprehensive national green standard in Ukraine – one that would be adapted to local conditions and possibly integrated into the regulatory framework governing construction activities. Although a number of legal and regulatory documents addressing energy efficiency, environmental design, and the Sustainable Development Goals (SDGs) have emerged in recent years, these instruments often remain fragmented and are not yet consolidated into a unified certification tool. This complicates the development of a systemic approach to the ecological transformation of architecture.

Moreover, there is a pressing need to adapt existing international green standards to the Ukrainian market, taking into account local socio-economic conditions, housing needs, and regional specifics. The integration of ecological criteria into urban planning, architectural design, and engineering solutions requires both scientific and regulatory substantiation.

In this context, it is essential not only to assess the current state of green certification implementation in Ukraine, but also to identify regulatory gaps, explore the potential of a national approach, and justify the feasibility of developing a context-sensitive national green standard aligned with the Sustainable Development Goals.

Review of Recent Studies and Publications. Within the growing interest in green construction in Ukraine, a number of studies have addressed various aspects of this field. T.I. Kryvomaz, A.P. Kulykov, and O.V. Petrochenko emphasized the importance of sustainable construction for preserving water resources, noting that the construction industry accounts for about 14% of drinking water use. They argue that implementing green technologies could substantially reduce this figure [1].

O.V. Hlushakova, O.H. Zhukova, and N.V. Nehoda examined ecological management and planning in green construction. Their work includes methodological recommendations for students specializing in environmental protection technologies, thereby contributing to the training of professionals in the field [2].

H. Kovalska and O. Homon focused on the integration of green architecture into the educational process, particularly through the use of green roofs and vertical farms. These practices help foster ecological thinking among future architects [3].

A series of regular international conferences, such as "Green Construction," hosted by Kyiv National University of Construction and Architecture, facilitates knowledge exchange between researchers, business representatives, and policymakers regarding the implementation of sustainable technologies [4].

A study published in the journal Ecological Safety and Environmental Management analyzed trends in green construction in Ukraine and Poland, emphasizing the need for government support and a favorable investment climate to further develop this sector [5].

Collectively, these works highlight increasing interest in sustainable construction in Ukraine, confirming its importance for sustainable development and the need for further research and practical implementation. Moreover, the integration of green building topics into academic curricula underscores their long-term significance for the professional training of architects and planners.

Purpose and Objectives. The aim of this study is to analyze the existing legal and regulatory framework in Ukraine and to justify the development of a conceptual model for a national green building standard. To achieve this aim, the following objectives were defined:

– to analyze Ukraine's legal and regulatory documents related to sustainable construction;

– to examine the relationship between green certification criteria and the United Nations Sustainable Development Goals (SDGs);

– to assess the current market for green-certified buildings in Ukraine, including their typological characteristics.

Materials and Methods. This research employs an interdisciplinary methodology that integrates theoretical analysis and empirical data collection to address the objectives outlined above.

The study draws on the following materials:

– Ukrainian legal and regulatory documents, including laws, state building codes (DBNs), ministerial orders, and Cabinet of Ministers resolutions related to energy efficiency, environmental design, and the UN Sustainable Development Goals. A full list of analyzed documents is provided in the bibliography;

– official data from international green certification systems, particularly from the databases and reports of LEED (U.S. Green Building Council), BREEAM (Building Research Establishment), and DGNB (German Sustainable Building Council) concerning certified buildings in Ukraine.

The methodology consists of the following components. *Systematic analysis of legal regulations*. A comprehensive review was conducted of existing Ukrainian legislation and regulatory frameworks to assess their compliance with environmental design principles and the SDGs. Logical and comparative methods were applied to evaluate the scope and consistency of various legal documents.

Comparative analysis of international green standards. The study juxtaposed key criteria of the LEED, BREEAM, and DGNB systems with the UN SDGs. *Content analysis* was used to identify correlations between certification standards and specific SDG targets. *Generalization techniques* were employed to derive conclusions about their interconnection.

Market analysis of green-certified buildings in Ukraine. The current state of Ukraine's green certification market as of April 2025 was assessed using official data from the certification systems. Typological analysis was conducted to identify the dominant building types undergoing certification (e.g., office, retail, residential). Statistical analysis was applied to quantify and evaluate trends in the number of certified projects.

Synthesis and generalization. Based on the collected data and analysis, conclusions were formulated regarding the current state of green certification in Ukraine, gaps in the legal framework were identified, and a rationale for developing a national green standard was presented.

These methodological approaches ensured a comprehensive examination of the subject and enhanced the validity of the study's findings.

Research Findings. *Legal Framework for Environmentally Responsible Building Design in Ukraine*. Ukraine has already established a foundational legal and regulatory framework that partially governs the environmental assessment and certification of buildings. This legislative base can serve as a platform for the development of a national green building certification system – a Ukrainian green standard.

Key documents currently forming the legal basis for integrating environmental principles into construction practices include:

– DBN B.2.6-31:2021 "Thermal insulation and energy efficiency of buildings", which defines performance requirements for building insulation in accordance with modern energy-saving standards [6].

– DBN B.1.2-11:2021 "Energy saving and energy efficiency", a document that sets out general principles to ensure energy efficiency at all stages of a building's lifecycle [7].

– The Law of Ukraine "On Energy Efficiency of Buildings" (2017, updated 2024), which provides criteria for energy certification and the assessment of buildings energy performance [8].

– The Law "On the Energy Efficiency Fund" (2017, revised 2024), which defines mechanisms for financing energy modernization initiatives [9].

– The Law "On Commercial Accounting of Heat and Water Supply" (2017, updated 2025), which establishes mandatory metering of utility consumption in buildings [10].

– Order of the Ministry for Regional Development, Construction, and Housing and Communal Services of Ukraine (2018, amended in 2021) "On Approval of the Procedure for Independent Monitoring of Energy Certificates". This order outlines the procedures for conducting independent control over energy certificates [11].

– Order of the Ministry for Regional Development, Construction, and Housing and Communal Services of Ukraine (2018, updated in 2025) "On Approval of the Procedure for Conducting Energy Efficiency Certification and the Form of the Energy Certificate". This document establishes the practical framework for implementing energy efficiency assessments [12].

– Law of Ukraine (2019) "On the Basic Principles (Strategy) of the State Environmental Policy until 2030". This law outlines the fundamental directions of the country's environmental transformation [13].

– Presidential Decree No. 722 (2019) "On the Sustainable Development Goals of Ukraine until 2030". This decree adapts the UN Sustainable Development Goals to the national context [14].

– Order of the Ministry for Communities and Territories Development (2020) "On Approval of Minimum Energy Efficiency Requirements for Buildings". This order establishes the minimum energy efficiency criteria for construction projects [15].

– Cabinet of Ministers Decree (2020, updated in 2023) "On Approval of the Concept for Implementing State Policy in the Field of Ensuring Energy Efficiency of Buildings in the Part of Increasing the Number of Nearly Zero-Energy Buildings and the National Plan for Increasing the Number of Such Buildings". This decree approves both the concept and the National Plan for the widespread implementation of nearly zero-energy buildings [16].

– Law of Ukraine (2022, updated in 2024) "On Energy Efficiency". This law unifies approaches to energy consumption management [17].

– Law of Ukraine (2023, updated in 2024) "On Amendments to Certain Laws of Ukraine to Create Conditions for Comprehensive Thermal Modernization of Buildings". This legislative act promotes large-scale energy-saving renovations [18].

– Cabinet of Ministers Decree (2024) "Certain Issues Concerning the Achievement of the Sustainable Development Goals in Ukraine". This document coordinates state policy in the context of implementing the Sustainable Development Goals [19].

This set of regulatory and legal documents reflects the state's intention to integrate the principles of sustainable development into the urban planning and architectural spheres, thereby forming a foundation for the further advancement of environmentally responsible practices in construction.

Consideration of Sustainable Development Goals in the Context of Legal Regulation of Environmental Certification. The effectiveness of implementing green standards largely depends on the systematic integration of regulatory requirements with national strategic guidelines in the field of sustainable development. Such an approach ensures not only compliance of architectural projects with current norms, but also their long-term resilience in accordance with the global development agenda.

It is important to emphasize that the Sustainable Development Goals (SDGs), adopted by the United Nations resolution "Transforming our world: the 2030 Agenda for Sustainable Development" (2015), have been reflected in Ukrainian legislation. In particular:

– According to the Presidential Decree of Ukraine No. 722 of 2019 "On the Sustainable Development Goals of Ukraine until 2030" [14], the state has undertaken official obligations to integrate the principles of sustainable development into policies and strategies at the national, regional, and sectoral levels.

– The Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine until 2030" [13] outlines the directions of environmental governance that align with the Global SDGs, particularly in the areas of energy efficiency, rational resource use, and adaptation to climate change.

One of the key features of green building standards is their ability to encompass all three core pillars of sustainable development: environmental, social, and economic.

Environmental dimension. Green standards include design and operational measures aimed at minimizing the negative environmental impact of buildings. This is achieved through improved

energy efficiency, reduced CO_2 emissions, optimized water usage, use of environmentally friendly materials, and waste reduction. These approaches not only align with national environmental policies but also contribute to achieving the goals of sustainable natural resource management. For example, SDG 6 "Clean Water and Sanitation" aims to ensure equal access to safe and affordable water, improve water quality, increase water-use efficiency, and protect and restore water ecosystems [20]. Green standards support efficient water use through conservation technologies, water quality control, irrigation solutions, and wastewater treatment.

Social dimension. Green standards assess the quality of the architectural environment in terms of comfort, safety, accessibility, and health impacts on users (residents). This includes aspects such as natural lighting, ventilation, acoustic comfort, ergonomics, and inclusivity. As a result, environmental certification fosters favorable living and working conditions, enhancing well-being and aligning with the principle of social equity in sustainable development. For instance, SDG 3 "Good Health and Well-being" seeks to reduce maternal mortality, combat epidemics such as tuberculosis and malaria, and lower child and neonatal mortality rates [21]. Green standards evaluate indoor air quality, acoustic and visual comfort, as well as the use of non-toxic materials and finishes.

Economic dimension. Although implementing green standards often involves higher initial investments, the long-term economic return is achieved through reduced operational costs, energy savings, increased real estate value, and greater investment attractiveness. For example, SDG 9 "Industry, Innovation and Infrastructure" focuses on developing quality, reliable, and sustainable infrastructure for economic growth, promoting inclusive industrialization, supporting domestic technologies, and expanding access to ICTs [22]. Green standards actively integrate IT solutions not only at the design stage but also throughout building operation. Additionally, some certification systems award points specifically for innovative solutions.

Thus, green standards are not merely technical regulations, but a comprehensive tool integrating architectural practice into the broader paradigm of sustainable development. Their implementation allows buildings to not only respond to contemporary challenges but also generate long-term environmental, social, and economic benefits.

Moreover, modern certification systems clearly trace the correlation between specific SDGs and the corresponding credits and criteria of green standards.

For instance, the LEED system demonstrates a direct alignment between assessment criteria and the SDGs, particularly SDGs 3, 6-13, 15, and 17 [23]. For example, SDG 3 "Good Health and Well-being" is reflected in the Indoor Environmental Quality criteria, while SDG 13 "Climate Action" is covered by requirements that account for 35 out of 100 possible points in the overall building rating (see Fig. 1).

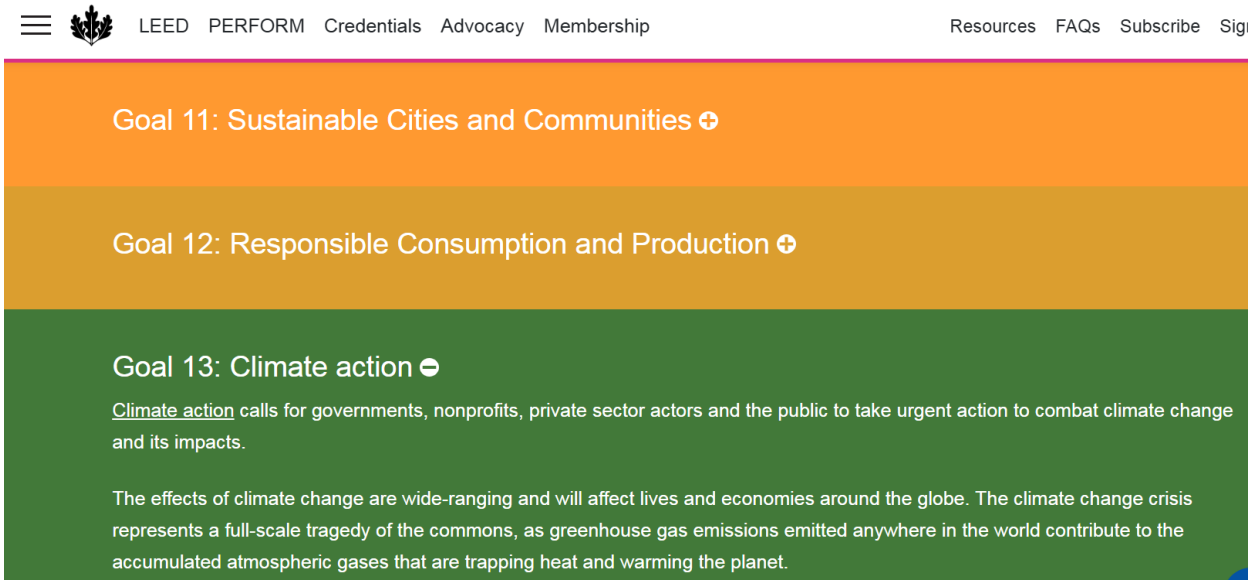

Fig. 1. Alignment of SDGs in the LEED System

The BREEAM system also aligns with global Sustainable Development Goals, covering SDGs 1-4, 7-9, and 11-16 [24]. For example, SDG 1 "No Poverty" is addressed by ensuring equal access to economic, natural, and financial resources, and strengthening resilience to social, economic, and environmental shocks (see Fig. 2).

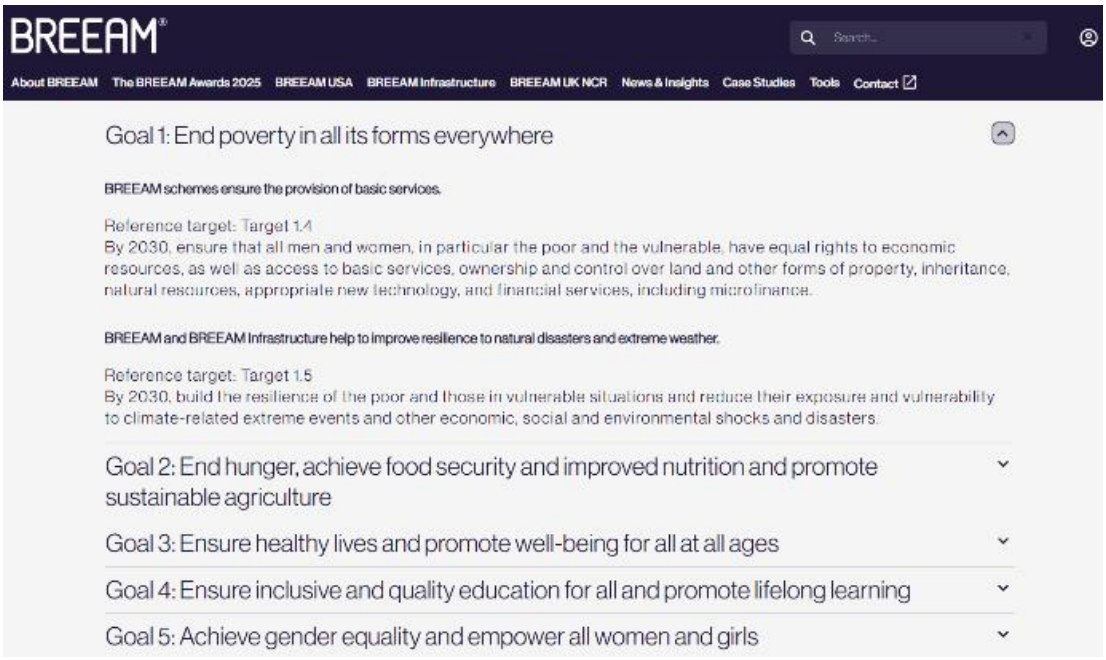

Fig. 2. Alignment of SDGs in the BREEAM System

The DGNB system conducted an internal analytical study to identify intersections between its certification criteria and the SDGs [25]. Results confirmed that DGNB addresses 15 out of the 17 Sustainable Development Goals, underlining its comprehensive scope (see Fig. 3).

Fig. 3. Alignment of SDGs in the DGNB System

Other certification systems such as WELL, Green Globes, and HQE also explicitly emphasize the correlation between their credits and the SDGs.

Assessment of the Current State of Green Building Certification Systems Implementation in Ukraine. To identify the key characteristics, trends, and typological features of certified projects, an analysis of the green certification market for architectural projects in Ukraine was conducted as of

April 2025. The study revealed that the number of implemented or certified projects remains at a few dozen, with several others in the process of certification or having submitted applications.

Currently, three major international certification systems are represented in the Ukrainian market: the American LEED (Leadership in Energy and Environmental Design), the British BREEAM (Building Research Establishment Environmental Assessment Method), and the German DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen). To provide a detailed overview of the market structure and to monitor current trends, let us examine the list of certified buildings.

According to LEED [26], eight projects are officially registered in Ukraine:

– The Shell office located in the Toronto-Kyiv multifunctional complex (Kyiv) – the first project in Ukraine to receive the LEED ID+C: Commercial Interiors certificate (2013).

– The U.S. Embassy in Ukraine "NOX Kyiv" (Kyiv), certified under LEED BD+C: New Construction (2014).

– Business campus B12 of the UNIT.City innovation park (Kyiv), certified under LEED BD+C: Core and Shell (2019).

– Business campuses B9-B10 at UNIT.City (Kyiv), also certified under LEED BD+C: Core and Shell (2020).

– Business campus B11 at UNIT.City (Kyiv), certified under LEED BD+C: Core and Shell (2021).

– Chanel boutique at Mandarin Plaza (Kyiv), certified under LEED ID+C: Retail (2021).

– Building B01 of the LvivTech.City innovation park (Lviv), certified under LEED BD+C: Core and Shell (2023).

– The Takeda company office (Kyiv), certified under LEED ID+C: Commercial Interiors (2023).

– Additionally, reports mention the recent certification of Mag.nett Business Center and K/MOST Business Center in Kyiv [27].

According to BREEAM [28], five certified projects are officially registered in Ukraine:

– Astarta Business Center (Kyiv), certified under BREEAM 2013 New Construction: Offices. Interim (2016) and BREEAM 2013 New Construction: Offices. Final (2018).

– Forum Lviv Shopping Mall (Lviv), certified under BREEAM 2009 Europe Commercial: Retail (2018).

– Diadans Residential Development (Kyiv), certified under BREEAM 2016 New Construction: Residential (2020).

– Winner Renault car dealership (Kyiv), certified under BREEAM 2016 New Construction: Commercial (2021).

– Silpo Re Cycling supermarket (Kyiv), certified under BREEAM 2016 New Construction: Commercial (2022).

Additional BREEAM-certified projects include:

– Optima Plaza Business Park (Lviv), certified under BREEAM In-Use International [29] (2017).

– Eurasia Business Center (Kyiv), certified under BREEAM In-Use [30] (2020).

– Prime Business Center (Kyiv), certified under BREEAM In-Use [31] (2020).

– Grand Business Center (Kyiv), also certified under BREEAM In-Use [32] (2020).

– Horizon Park Business Center (Kyiv), certified under BREEAM In-Use International [33] (2020).

According to the DGNB system [34], only one certified project is officially registered in Ukraine – a Billa supermarket operated by an Austrian retail chain (2014).

The analysis of these data indicates that the number of certified buildings in Ukraine remains limited. However, there is a growing interest in green standards. It is also noteworthy that most certified projects are public or commercial buildings, while the residential sector remains largely unaffected by green certification initiatives.

In light of these circumstances, the author suggests the initiation of a unified national register of buildings certified under green standards. This would support information systematization,

monitoring of certification processes, and promotion of environmental standards among developers and the wider public.

Conclusions. The conducted study confirms the existence of both challenges and prospects for the development of green building in Ukraine. The analysis of the regulatory and legal framework indicates that there are individual legislative initiatives at the national level related to energy efficiency, emission reduction, and climate change adaptation. However, Ukraine still lacks a comprehensive national green standard that would take into account the specifics of the local market, construction sector, and climatic conditions.

The assessment of certified green buildings shows that the number of projects recognized by international certification systems (LEED, BREEAM, DGNB) remains limited and is concentrated mainly in large cities and within commercial or office real estate. Residential buildings, in contrast, are almost entirely absent from the green certification landscape.

The comparative analysis of green standard criteria and the UN Sustainable Development Goals demonstrates that these systems promote the achievement of environmental, economic, and social targets. Given that the SDGs have been officially incorporated into Ukrainian legislation, it would be reasonable for a future national green standard to explicitly reflect these goals.

Furthermore, the study supports the initiative to establish a national certification system tailored to local needs, as well as a public register of certified buildings. Such measures would not only enhance transparency but also increase awareness of and demand for environmentally responsible construction among professionals and the general public.

In summary, the systematic implementation of green standards in Ukraine should rely on a comprehensive legislative base, integration of international experience, alignment with the SDGs, and context-specific scientific adaptation.

Future research will focus on developing a conceptual framework for a national green standard adapted to the regional context. According to global trends, this should also incorporate aesthetic and visual qualities of architecture as evaluation criteria.

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РЕЙТИНГОВІ СИСТЕМИ ЕКОЛОГІЧНОЇ СЕРТИФІКАЦІЇ АРХІТЕКТУРИ В УКРАЇНІ: СУЧАСНИЙ СТАН ПРОБЛЕМИ

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Анотація. В статті проаналізовано поточний стан впровадження зелених стандартів у будівельній галузі України. Актуальність дослідження зумовлена глобальними викликами (зміна клімату, виснаження ресурсів, урбанізація тощо), які вимагають адаптації будівельного

сектору для досягнення Цілей сталого розвитку (ЦСР). Світова практика доводить ефективність міжнародних систем сертифікації (LEED, BREEAM, DGNB та інших) для зниження викидів, оптимізації енергоспоживання, покращення якості середовища, кондицій людини тощо. Однак, попри окремі позитивні приклади, їхнє впровадження в Україні залишається обмеженим, в тому числі через відсутність повноцінного національного зеленого стандарту, адаптованого до місцевих умов. Існуюча українська нормативно-правова база, хоч і містить ряд положень щодо енергоефективності та екологічного проєктування, не забезпечує при цьому системного підходу. Особлива увага приділяється необхідності адаптації міжнародного досвіду до соціально-економічних умов та регіональних особливостей України.

Методологія дослідження включає системний аналіз нормативно-правової бази України, пов’язаного з питаннями екологічного будівництва, аналіз кореляції міжнародних зелених стандартів (LEED, BREEAM, DGNB) з Цілями сталого розвитку ООН, а також емпіричний аналіз ринку екологічно сертифікованих будівель в Україні (станом на квітень 2025 року).

Результати показали, що в Україні сформовано певне нормативно-правове підґрунтя, яке регулює окремі аспекти екологічної сертифікації будівель, підтверджуючи прагнення держави до інтеграції принципів сталого розвитку. Міжнародні зелені стандарти, в свою чергу, демонструють високу відповідність Глобальним Цілям сталого розвитку, охоплюючи екологічну, соціальну та економічну складові. Аналіз ринку сертифікованих об'єктів виявив їх обмежену кількість (в межах кількох десятків проєктів), зосереджених переважно у громадському та офісному сегментах у великих містах, тоді як житловий фонд майже не охоплений рейтинговими системами екологічної сертифікації.

Дослідження підтверджує наявність проблем і значний потенціал для розвитку зеленого будівництва в Україні. Необхідна розробка цілісного національного зеленого стандарту, адаптованого до української специфіки, а також створення єдиного національного реєстру сертифікованих об'єктів для систематизації інформації та популяризації екологічних стандартів. Системне впровадження зелених стандартів має базуватися на комплексній законодавчій основі, інтеграції міжнародного досвіду, відповідності ЦСР та науково обґрунтованій адаптації до національного контексту.

Подальші дослідження планується спрямувати на формування концепту шаблону національного зеленого стандарту з урахуванням інтеграції візуальних й естетичних якостей архітектури.

Ключові слова: зелені стандарти, LEED, BREEAM, DGNB, екологічна сертифікація, сталий розвиток, цілі сталого розвитку.

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