

Thus, for the formation of an entrepreneurial ecosystem, great importance is attached to communication between the public and private sectors in order to facilitate effective dialogue between representatives of education, science, business and local government. The need to study the key parameters of a successful innovative entrepreneurial ecosystem, the full implementation of the innovation creation and commercialization process determines the relevance of the work. It is important to develop practical recommendations in the country for the development of an innovative ecosystem in priority sectors of the country's economy. Thus, the development of an innovative entrepreneurial ecosystem is truly valuable and important.

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STRATEGIES FOR INTEGRATING THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT INTO THE ACTIVITIES OF CONSTRUCTION ENTERPRISES

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According to McKinsey, construction is one of the most important sectors of the global economy, accounting for about 13% of global GDP [1, p. 2]. This significant share of the economy underscores the importance of the industry, which, at the same time, faces new challenges. The construction industry's future is determined by global trends such as increasing urbanisation and awareness of environmental responsibility. The model of construction, which takes into account the principles of sustainable development, is becoming more and more widespread. This concept emerged as a response to growing concerns about climate change and resource depletion and the growing social responsibility to minimize environmental impact while balancing

environmental protection, economic viability, and social justice [2, p. 5]. Society increasingly expects companies to behave responsibly, including in terms of environmental, social, and economic aspects. This creates a need to develop and implement effective strategies to reduce negative environmental impacts and improve social well-being.

Because of these global trends, it is important to note that the construction sector in Ukraine is also showing signs of active development. In Ukraine, the construction market 2024 was estimated at UAH 170 billion and grew by 6% compared to 2023 [3]. After the pandemic recession and before the beginning of the Russian Federation's full-scale invasion of Ukraine, our country's construction industry showed positive dynamics. The increase in demand for building materials and the increase in production capacity was caused by implementing the “Great Construction” program. Thus, in 2015, the share of construction in the total GDP of Ukraine was 2.89%; in 2017, it was already 3.54%, and in 2019, it was 3.97% [4, p. 5]. And with the beginning of the full-scale invasion of the Russian Federation into Ukraine, the growth of demand intensified, as a result of the destruction suffered by at least 213.3 thousand buildings [5, p. 36]. A significant part of the destroyed buildings was built during the period of the USSR, and their design life exceeded its design life. In this context, the restoration of the country's housing stock appears to be an urgent need, requiring the introduction of new standards in construction. Also, given the problems with electricity in Ukraine, it is important that environmental standards are met and the energy efficiency of new buildings is ensured. This will ensure reduced energy consumption and decreased dependence on centralized power sources in the face of energy challenges. Therefore, to restore the housing stock, new buildings will be built that must meet modern energy-efficient standards and introduce the latest technologies.

Investments in research and development of new technologies in the construction sector play an important role in the sustainable development of construction. Unlike the highly developed countries of the world, Ukrainian enterprises demonstrate a slow pace of introduction of new technologies into production with minimal impact on the environment (Fig. 3.2).

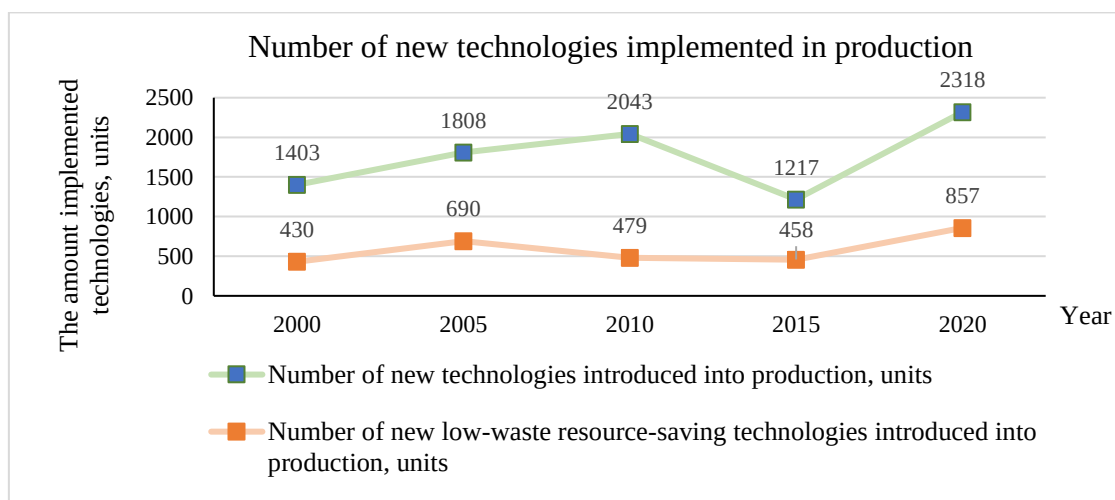


Figure 3.2 – Dynamics of the use of new technologies at Ukrainian enterprises [6]

Investments by Ukrainian enterprises in environmental protection in monetary terms before the beginning of the full-scale Russian invasion of Ukraine showed positive dynamics but still remained significantly lower than the volumes in leading countries of the world. Therefore, they need further development and support from the state (Fig. 3.3).

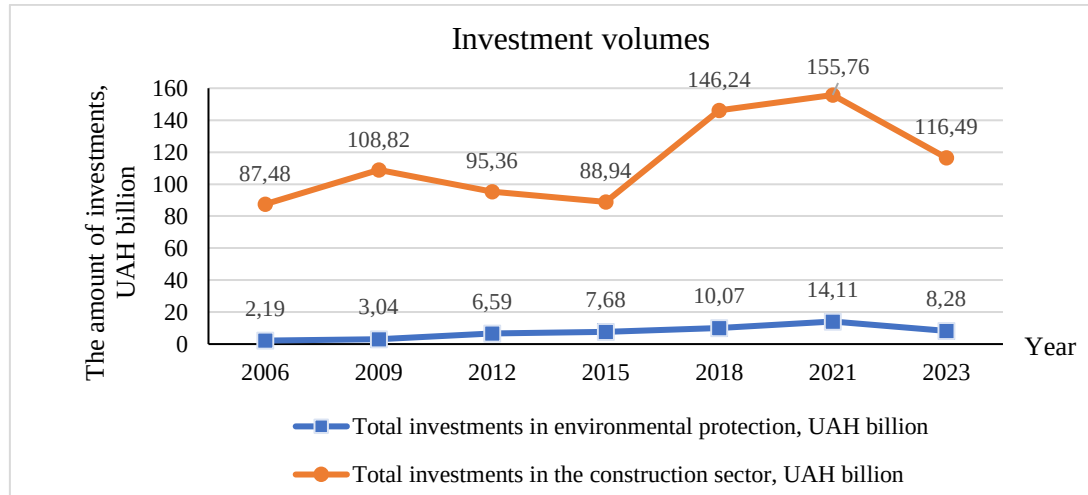


Figure 3.3 – Dynamics of investments in Ukraine [6]

While the global movement towards sustainable construction is gaining momentum, it faces various challenges. These include regulatory barriers, financial constraints, lack of awareness, and technological limitations in different regions. Addressing these challenges requires concerted efforts by governments, industry, and the public to create an enabling environment for sustainable practices. Government policy also plays a key role in shaping the sustainable development of construction. Governments can implement building codes and regulations that require energy efficiency, water conservation, and the use of environmentally friendly materials in construction projects. So, among the most common international standards are: LEED system, BREEAM, Green Star, DGNB. Also, the European Union Energy Performance of Buildings Directive (EPBD) sets zero-emission requirements for new buildings and obliges buildings to meet their energy needs from renewable sources, effectively reducing on-site carbon emissions to zero [7]. As for Ukraine, by 2025, the Ministry for Communities and Territories Development of Ukraine has planned to develop 80 standards to implement design and construction optimization processes, including BIM technologies, and remove barriers to the application of Eurocodes [3]. Governments can also encourage sustainable development in construction through incentives such as tax breaks, subsidies, and grants, making this type of construction more economically viable for developers and property owners. In countries such as Germany and the United States of America, tax incentives have successfully promoted the installation of renewable energy systems in buildings. In some EU countries, conditions have been created at the legislative level, making it much more profitable for entrepreneurs to recycle construction waste rather than take it to a landfill. For example, the construction

waste recycling level in the Netherlands is 90%, in Belgium – 87%, in Denmark – 81%, in the UK – 45%, in Finland – 43%, in Austria – 41% [5, p. 105].

The integration of sustainable development principles into the activities of construction enterprises can be based on some basic strategies. First, the assessment of the success of an enterprise should be measured not only by the results of the income received, but also by considering the impact of its activities on the population of the country and the planet as a whole. Secondly, the interaction with interested parties (stakeholders) is worth noting to correctly identify their needs and requests and form certain further strategies [8, p. 6-8]. Thirdly, using the latest achievements and technologies in the construction sector, including environmentally friendly building materials that reduce environmental impact, alternative energy sources, IoT sensors and monitors, etc. For example, in reconstructed buildings equipped with facade modules with thermal insulation, energy consumption for heating can be reduced by 30–50%, significantly reducing residents' costs and contributing to the environmental friendliness of buildings. Green buildings in the United States of America consume 25% less energy and have 10-20% lower operating and maintenance costs than traditional buildings, increasing the potential long-term return on investment [9]. In the context of sustainable development strategies for construction enterprises, the concept of life cycle thinking occupies an important place. It is based on a comprehensive analysis of all stages of activity — from the purchase of materials to their final decommissioning — and aims to find effective ways to reduce the negative environmental impact. This may include using renewable materials, reducing waste, and producing residues that can be easily recycled or disposed of.

Among the main recommendations for the sustainable development of construction in Ukraine are the following: to develop an economic mechanism to support the implementation of environmental standards at the enterprise, to improve the relevant regulatory framework that will take into account international systems of standards, and also to resolve the issue of supplying and labelling environmentally friendly building materials to the domestic market based on government orders.

Thus, implementing sustainable development principles in the construction industry is becoming increasingly important at the global and national levels. This is reflected in the use of renewable materials, the implementation of energy-efficient technologies, the optimization of water consumption and the minimization of waste. International standards and government policies play an important role in this process, creating the necessary conditions for the industry's transformation. Implementing these principles not only contributes to the preservation of the environment but also ensures economic efficiency and creates a comfortable environment for future generations.

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ОСОБЛИВОСТІ ФОРМУВАННЯ ВИТРАТ В ПРОЄКТАХ СТАЛОГО РОЗВИТКУ ТА ЗЕЛЕНОЇ ЕКОНОМІКИ

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Сталий розвиток та зелена економіка є ключовими напрямками сучасної економічної політики, спрямованими на гармонізацію економічного зростання з екологічною безпекою. Витрати на реалізацію таких проєктів мають свою специфіку, що зумовлено необхідністю впровадження екологічних технологій, дотриманням регуляторних вимог та залученням спеціального фінансування.

Основними категоріями витрат у проєктах сталого розвитку є [1; 2]:

1. Формування витрат у проєктах зеленої економіки можна поділити на такі категорії: капітальні витрати (витрати на будівництво, закупівлю екологічного обладнання, розробку та впровадження технологій); операційні витрати (витрати на експлуатацію та обслуговування екологічних об'єктів); адміністративні витрати (витрати на управління проєктом, отримання екологічних сертифікатів та ліцензій); витрати на дослідження та інновації (інвестиції у розробку нових екологічних технологій).