



ECO-INNOVATION AND SUSTAINABLE ENTREPRENEURSHIP IN THE ERA OF GLOBALIZATION

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Abstract

This article analyzes the role of eco-innovations as a key factor in the development of sustainable entrepreneurship in the context of globalization. The paper identifies the main vectors for the implementation of environmental technologies and practices, and analyzes the barriers and challenges that enterprises face. Examples of successful integration of eco-innovations into business models are given, and recommendations for their adaptation in the context of developing economies are formulated.

Keywords: Eco-innovation, sustainable entrepreneurship, globalization, green economy, corporate sustainability.

Introduction

The novelty of the study lies in the comprehensive analysis of the role of eco-innovations in the formation of sustainable entrepreneurship, taking into account both global practices and the characteristics of developing economies. A systematization of barriers and practical solutions for overcoming them is proposed.

In the context of globalization, environmental sustainability issues are becoming key issues for modern business. Increased global consumption, depletion of natural resources and climate change are stimulating companies to search for new business models based on the principles of environmental responsibility and innovation [1].

Eco-innovation, defined as new products, processes, marketing or organizational methods aimed at minimizing negative impacts on the environment, is a key tool



for sustainable entrepreneurship. Unlike traditional innovation, its goal is not only to improve economic efficiency, but also to achieve environmental and social benefits [2].

Sustainable entrepreneurship involves integrating environmental innovations into a company's business model, which allows not only to meet current societal needs but also to create long-term competitive advantages. According to the Organization for Economic Cooperation and Development, companies that implement eco-innovations demonstrate increased resilience to crisis phenomena and are more adaptable in changing global markets [3].

Thus, the relevance of the study of eco-innovations in the context of sustainable entrepreneurship is due to the need to develop new strategies that will ensure a harmonious combination of economic growth and environmental safety.

The concept of eco-innovations was formed at the intersection of research in the field of innovation management, sustainable development and ecological economics. According to the classic definition by K. Rennings, eco-innovations are new products, processes or organizational methods that help reduce the environmental burden and use resources more efficiently [4]. Unlike traditional innovations, the main goal of eco-innovations is not only economic growth, but also the minimization of negative impact on the environment.

The theoretical basis of sustainable entrepreneurship is closely linked to the concept of the «triple bottom line» proposed by J. Elkington. This concept includes economic, environmental and social components, according to which entrepreneurial activity should create not only profit, but also a positive environmental and social effect [5].

Contemporary research emphasizes that sustainable entrepreneurship is based on the integration of environmental innovations into a company's business model [6]. It involves the formation of a long-term strategy that takes into account global challenges such as climate change, depletion of natural resources, and increasing demands for corporate social responsibility.

Theoretical approaches to eco-innovations can be divided into three groups:

- the technological approach focuses on the development of new “green” technologies that can reduce the resource intensity of production;



- the institutional approach pays attention to the role of government policies, tax incentives and regulations;

- the organizational and cultural approach is focused on changes within the corporate culture and the involvement of employees in the process of implementing sustainable practices [7].

Therefore, the theoretical foundations of eco-innovation and sustainable entrepreneurship form a conceptual framework that allows combining the economic interests of business with the global challenges of sustainable development.

Leading international corporations are using eco-innovation as a strategic tool to achieve sustainable development goals. Their main areas of activity include the transition to a circular economy, the implementation of “green” design, and the use of digital platforms for energy management and decarbonization of supply chains.

«IKEA» is systematically moving towards using renewable and recycled materials, which currently make up 55% and 17% of their total volume, respectively. This is part of their People & Planet strategy. Positive . The company also develops services to extend the life cycle of products, such as «buy-back & resell» programs, which is in line with the principles of the circular economy [8]. Unilever has set ambitious climate targets to reduce operational emissions (Scope 1–2) and Scope 3 emissions. By 2023, the company has achieved a 70% reduction in Scope 1–2 emissions compared to 2015 levels [9]. The climate plan is being implemented in partnership with retailers, including «Walmart», to reduce emissions across the supply chain.

Carpet tile manufacturer Interface has achieved a significant reduction in the carbon footprint of its products by 74% and a reduction in waste sent to landfills by 84% [10]. This was made possible by implementing the «Mission Zero» and the subsequent «Climate Take Back», focused on the use of secondary and bio - materials.

«Patagonia» has launched the Worn program Wear, aimed at extending the life cycle of products. Repair and reverse logistics initiatives create a circular system of reuse, which helps reduce waste [11]. The company regularly conducts on-site services for the repair and resale of its products.



Through the Schneider program Sustainability Impact (SSI) and the energy management solutions portfolio of «Schneider Electric» helps its customers «avoid» carbon emissions. In its 2023 report, the company recorded progress towards the target of 800 million tonnes of CO₂e [12]. This example demonstrates the role of digital technologies in achieving environmental goals.

Table 1 - Cases of eco-innovations in global companies

Company	Key eco-innovation	Business result	Eco-effect (example metric)
IKEA	Circular design, share of renewable/recycled materials, buy-back & resell	Increased loyalty, decreased material consumption	55% renewable and 17% recycled materials; Net targets Zero and Beyond
Unilever	Decarbonization of operations and value chains (Scope 1–3), climate partnerships	Supply chain risk mitigation, ESG access to capital	-70% Scope 1–2 by 2023 vs 2015; joint projects with retailers
Interface	"Mission Zero"/"Climate Take Back", secondary And bio - materials	Product differentiation, sustainable purchasing	-74% carbon footprint of products; -84% waste to landfill
Patagonia	Worn Wear (repair/resale), mobile repair services	Strengthening the brand, circular revenue	Increasing the share of extended use and reducing waste
Schneider Electric	Digital Platforms for Energy Efficiency (SSI 2021–2025)	Revenue from green services, customer centricity	Progress towards the goal: help “avoid” 800 million t CO ₂ e

Thus, eco-innovations scale faster when they are embedded in strategy and product. Decarbonization of value chains requires partnerships across the ecosystem. Circular services (repair/ re-sale) simultaneously strengthen the brand and reduce waste. Digital energy management platforms allow sustainability to be monetized as a service.

Despite the obvious benefits of eco-innovations for sustainable entrepreneurship, companies face a number of barriers that limit their scalability and effectiveness:

1. Financial and economic barriers. High costs of implementing eco-innovative technologies, especially for small and medium-sized businesses, prevent their widespread dissemination. Research shows that limited access to «green finance» and a lack of long-term investment are key obstacles to the transition to sustainable business models.



2. Organizational and cultural barriers. Resistance to change within companies and traditional corporate culture hinder the implementation of sustainable practices. The works of E. Schein emphasize that organizational culture can act as a factor restraining innovation if it is focused exclusively on short-term profit [13].
3. Technological and infrastructural limitations. The lack of available technologies and the absence of mature infrastructure (e.g. for recycling and waste management) pose challenges for the implementation of circular business models. According to the European Commission, only 12% of secondary materials are returned to the EU economy, indicating a low level of development of the relevant infrastructure.
4. Regulatory and institutional barriers. The heterogeneity of national legislation and the lack of unified standards hinder the effective implementation of eco-innovations at the global level. The study by M. Janicke and K. Jacob indicates that the inconsistency of the regulatory framework slows down the transformation of business models and reduces the investment attractiveness of «green» projects [14].
5. Social and behavioral challenges. Consumer skepticism about «green» products and concerns about their price and quality slow down the process of innovation adaptation. According to «Gallup», although the number of consumers focused on ESG principles (environment, social responsibility, corporate governance) is growing, there is still a significant proportion of those who prioritize short-term savings [15].

Table 2 - Main barriers to the implementation of eco-innovations

Category of barriers	Examples of manifestation
Financial and economic	High cost of technology, lack of investment
Organizational and cultural	Resistance to change, focus on short-term profit
Technological	Lack of processing infrastructure, limited access to innovation
Regulatory	Inconsistency of standards, differences in legislation
Social	Consumer distrust, price sensitivity



The development of eco-innovations in the context of globalization requires an integrated approach that combines institutional, technological and managerial measures.

An important area is the harmonization of the regulatory framework and the stimulation of long-term «green» investments. According to M. Janicke and K. Jacob, the coherence of environmental policies at the international level increases the investment attractiveness of sustainable business models and reduces risks for companies [14].

The second strategic priority is to support research and development in the field of eco-technologies. The European Commission emphasizes that investments in «clean» technologies contribute to the formation of competitive clusters and encourage small and medium-sized enterprises to switch to sustainable practices. Equally important is the digitalization of environmental initiative management processes. Big data and artificial intelligence tools allow companies to track their carbon footprint, optimize energy consumption, and predict environmental risks. Special attention should be paid to corporate culture and employee engagement. According to a «Gallup» report, companies with high levels of employee engagement demonstrate greater effectiveness in implementing eco-initiatives, since employees perceive sustainable development as part of the organization's values.

Finally, an important recommendation is the development of partnerships and collaborations between business, government and civil society. The World Economic Forum notes that cross-sector alliances create conditions for large-scale implementation of eco-innovations, allowing for the pooling of resources and expertise.

Thus, recommendations for the development of eco-innovations include: harmonization of the international regulatory framework, support for “green” research and development, implementation of digital tools for sustainability management, formation of a corporate culture focused on sustainable development and development of cross-sector partnerships for scaling eco-innovations.

Eco-innovations are becoming an integral element of global companies' strategies and a key condition for their competitiveness in the era of globalization.



Successful implementation of sustainable entrepreneurship principles requires not only the introduction of technological innovations, but also transformational changes in corporate culture, the formation of new partnership models and corresponding state policies.

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