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IMPLEMENTATION OF GREEN TECHNOLOGIES AND SUSTAINABLE PRACTICES IN BUSINESS

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ВПРОВАДЖЕННЯ ЗЕЛЕНИХ ТЕХНОЛОГІЙ ТА СТАЛИХ ПРАКТИК У БІЗНЕС

Green technologies and sustainable practices in business implementation are relevant and important topics in the modern world. This is driven by the increasing awareness of society regarding escalating environmental issues. As a result, there is a growing demand for such practices in business, now known as sustainable entrepreneurship or corporate sustainability, which focus on the adoption of approaches, strategies, and methods aimed at achieving economic, social, and environmental goals, simultaneously ensuring the quality of life for the modern generation, preserving opportunities for future generations. Therefore, the research aims to identify the specifics of implementing green technologies and sustainable practices in domestic business. The achievement of the goal set in the article was accomplished through the following research methods: logical generalization and scientific abstraction, structural analysis, analytical method, and systemic analysis. The research results underscore the importance of integrating green technologies and sustainable practices into business operations to achieve sustainable development and a positive impact on the environment. It is concluded that the implementation of green technologies encompasses various directions, including the utilization of renewable energy, efficient resource utilization, waste management, green logistics, incorporation of sustainable practices into product design, and many others. Such variability underscores the necessity for a profound reorientation of enterprises towards ecologically responsible approaches. The research results establish that the implementation of green technologies demands more than just technical changes. It's emphasized that this process involves a transformation of the organizational culture, engagement of personnel in new values and

approaches, as well as changes in strategies and interactions with stakeholders. The implementation of green technologies is a logical extension of adopting sustainable practices. The prospects for further research lie in developing parameters for assessing the impact of green technology implementation on the financial performance of businesses and the reputation of the enterprise among clients, partners, and investors.

Впровадження зелених технологій та сталих практик у бізнесі є надзвичайно актуальною та важливою темою в сучасному світі. Це зумовлене тим, що відбувається зростання свідомості суспільства щодо загострення екологічних проблем. Наслідком стає збільшення попиту на такі практики в бізнесі, які наразі відомі як стале підприємництво або корпоративна сталість. Ці практики орієнтовані на впровадження підходів, стратегій та методів, спрямованих на досягнення економічних, соціальних та екологічних цілей, забезпечуючи одночасно якість життя сучасного покоління і збереження можливостей для майбутніх поколінь. Метою дослідження є визначення особливостей впровадження зелених технологій та сталих практик у вітчизняному бізнесі. Досягнення поставленої у статті мети здійснено за допомогою таких методів дослідження: логічного узагальнення та наукової абстракції, структурного аналізу, аналітичного методу та системного аналізу. В результаті дослідження було підкреслено важливість впровадження зелених технологій та сталих практик у бізнесі для досягнення сталого розвитку та позитивного впливу на навколишнє середовище. Зроблено висновок, що впровадження зелених технологій охоплює різні напрямки, які включають в себе використання відновлюваної енергії, ефективне використання ресурсів, управління відходами, зелену логістику, залучення сталих практик у дизайн продуктів та багато інших. Така варіативність підкреслює необхідність глибокої переорієнтації підприємств на екологічно відповідальні підходи. Результати дослідження свідчать, що впровадження зелених технологій вимагає більшого, ніж просто технічні зміни. Підкреслено, що цей процес передбачає трансформацію культури організації, залучення персоналу до нових цінностей та підходів, а також зміну стратегій та взаємодій зі зацікавленими сторонами. Впровадження зелених технологій є логічним продовженням впровадження сталих практик. Обидва напрямки сприяють зниженню негативного впливу на навколишнє середовище та забезпеченню сталого розвитку, а також відкривають нові можливості для бізнесу. Перспективи подальших досліджень полягають у розробці параметрів для оцінки впливу впровадження зелених технологій на фінансову результативність бізнесу та на репутацію підприємства серед клієнтів, партнерів та інвесторів.

Key words: personnel engagement; achieving sustainable development; resource utilization; waste management; environmentally responsible approaches.

Ключові слова: залучення персоналу; досягнення сталого розвитку; використання ресурсів;, управління відходами; екологічно відповідальні підходи.

PROBLEM STATEMENT

Green technologies and sustainable practices in business implementation are relevant and important topics in the modern world. It is resulting from the increasing societal awareness of escalated environmental issues, resulting in a growing demand for such business practices. Currently known as sustainable entrepreneurship or corporate sustainability, these approaches involve strategies and methods of adoption aimed at achieving economic, social, and ecological objectives. It simultaneously ensures the quality of life for the present generation while preserving opportunities for future generations. Furthermore, climate change and its associated negative consequences, such as rising sea levels and coastal flooding, increased frequency and intensity of natural disasters, and biodiversity loss, with limited resources, have emphasized the need for the incorporation of green technologies in business. Specifically, this involves the utilization of innovative technologies and practices to mitigate the adverse impact on the environment and conserve resources. These technologies are aimed at sustainable development, ensuring ecological efficiency, and reducing emissions of harmful substances. As a result, the study of implementing green technologies and sustainable practices in business is quite significant and timely.

Table 1. Experience of applying green technologies and sustainable practices in business in Ukraine as of 2023.

Business	Benefits of applying green technologies and sustainable practices in business				
	Reduction of negative environmental impact [1]	Enhancement of resource utilization efficiency [2]	Improvement of business image [3]	Creation of innovative potential [4]	Cost reduction. [5]
LLC "Bayadera Logistics"	+	+	+	-	+
JSC "Farmak"	-	+	+	+	-
LLC "TTVK" (TUI Ukraine tour operator)	-	+	+	+	-
LLC "Bayer"	+	+	-	+	+
LLC TD "Delta Wilmar"	+	+	+	-	-
PJSC "JTI International Ukraine"	-	+	+	-	+
LLC "Metinvest Engineering"	+	-	+	+	+
LLC "D&E Evolution"	+	+	-	+	+
LLC "GreenStay Hotels"	+	+	+	-	+

Note

[1] The implementation of environmentally friendly technologies and practices allows enterprises to significantly reduce emissions of harmful substances, water pollution, and other forms of negative impact on nature.

[2] Green technologies contribute to the rational use of resources such as energy, water, and raw materials. This enables a decrease in production costs, an increase in competitiveness, and a reduction in waste.

[3] Modern consumers are increasingly focused on the environmental aspects of business activities. Companies that actively adopt green technologies can attract more customers and investors, as they are perceived as socially and environmentally responsible.

[4] The development of green technologies requires ongoing research and innovation. This can stimulate technological advancements within companies and foster the emergence of new markets.

[5] The implementation of green technologies can help reduce energy expenses, optimize production processes, and streamline resource management.

Source: compiled based on data from economic entities.

ANALYSIS OF RESEARCH AND PUBLICATIONS

Numerous scientific works by both domestic and foreign scholars, such as Chychkalo-Kondratska I.B., Lekunovich A.Yu., Lehka Ya.V., Clark K., and Daly H.E., are dedicated to the issues of sustainable business development and the possibilities of achieving it. However, there is a need for a more detailed investigation into the specifics of implementing green technologies and sustainable practices in business, as this field is constantly evolving and changing.

The wording of the purposes of article (problem). The research aims to identify the specifics of implementing green technologies and sustainable practices in domestic business. In doing so, these specifics should elucidate the properties, traits, or distinctive aspects of the investigated process.

Presentation of the main material. Currently, the issues of implementing green technologies and sustainable practices in business are becoming increasingly relevant, driven by the numerous advantages derived from their utilization [1; 4]. Drawing from the available experience of applying green technologies and sustainable practices in Ukrainian business, we have identified their key benefits (Table 1): reduction of negative environmental impact, enhanced resource efficiency, improved business image, innovative potential, and cost reduction.

The experience of applying green technologies and sustainable practices in Ukrainian businesses as of 2023 is dynamic and diverse. Accumulated knowledge underscores that the integration of these approaches is a pivotal factor for success in the modern world, where ecological sustainability and responsibility towards nature have become necessities. According to recent research [1—2; 6], it has been repeatedly demonstrated that businesses willing to technologically adapt to this new standard will have an advantage in addressing the environmental, economic, and future social challenges.

The implementation of green technologies in business can encompass a wide range of areas (including renewable energy, energy efficiency, electromobility, efficient water usage, waste management, green logistics, eco-product design, use of renewable materials, integrating "green" initiatives into organizational culture, consumer habits, and services). Each of these areas aims to mitigate the negative impact on the environment and ensure sustainable development, as characterized in Table 2. It's important to

Table 2. Fundamental directions for implementing green technologies in business

Direction of Implementation	Sphere of technology application
Renewable energy	Utilization of solar, wind, hydro energy, and other renewable energy sources instead of coal and other high carbon emission fuels.
Energy efficiency	Implementation of technologies that reduce energy consumption, such as using energy-efficient lighting systems, building insulation, etc.
Electromobility	Transition from traditional gasoline and diesel vehicles to electric vehicles with lower emissions.
Effective water usage	Implementation of technologies that enable efficient water usage and conservation, such as rainwater harvesting systems, improved irrigation systems, etc.
Waste management	Utilization of technologies for waste sorting and recycling, minimizing waste in production.
Green logistics	Enhanced methods of product delivery and transportation to reduce CO2 emissions.
Ecological product design	Development of products with a reduced environmental impact throughout their entire life cycle, including production, usage, and disposal.
Utilization of renewable materials	Substitution of traditional materials with more environmentally friendly alternatives, such as bioplastics or sustainably sourced wood.
Integration of "green" initiatives into organizational culture	Promotion of eco-friendly practices among employees, both at work and in their personal lives.
Consumer habits and services	Creation of products and services that encourage sustainable consumer behavior, such as recycled or second-hand goods.

Source: formed based on [1; 5—6].

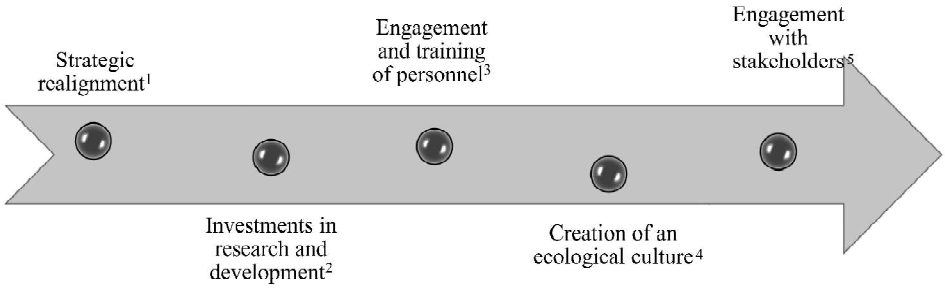

Figure 1. Key features of implementing green technologies in domestic businesses

Note:
[1] It can involve changes in the product lineup, use of renewable energy sources, and improved waste management, among other aspects.
[2] It can encompass investments in research and development of new products, processes, and services that are environmentally efficient.
[3] It may include investments in training existing personnel and attracting new experts.
[4] It involves fostering a culture of responsibility towards nature and promoting sustainable development among staff and management.
[5] It can incentivize stakeholders to collaborate on the implementation of green technologies. Cooperation with them can support and promote the adoption of green initiatives.
Source: formed based on [2; 3—4].

note that the incorporation of green technologies into business entails specific considerations, as it requires changes in strategies, approaches, and cultural transformations within organizations.

The directions for implementing green technologies different in popularity and reflect different aspects of integrating these technologies into businesses. However, collectively, each of these directions is geared towards reducing environmental impact and supporting sustainable development. Specifically, among the key features of implementing green technologies in domestic businesses within the highlighted directions are strategic realignment, investments in research and development, personnel recruitment, and training, fostering an ecological culture, and engagement with stakeholders (Figure 1).

Thus, given the outlined features, it becomes evident that green technologies implementation requires a comprehensive approach involving the integration of various ecological aspects into business operations to achieve environmental sustainability while ensuring the successful functioning of the enterprise. For instance, LLC "GreenStay Hotels", when establishing environmentally oriented hotels, adopts a comprehensive approach to green technologies implementation. They ensure a comfortable stay for clients (Figure 2), resulting in reduced

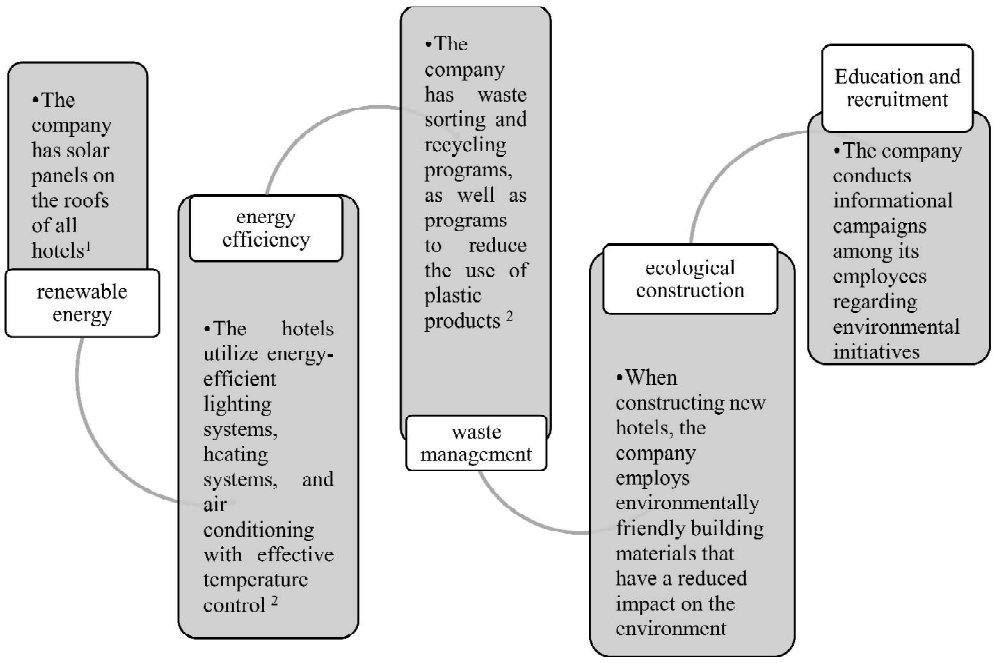

Figure 2. Comprehensive approach to green technology implementation in business: "GreenStay Hotels"

Note:
[1] Enables the generation of a portion of the required electricity from solar energy, reducing the consumption of conventional energy sources.
[2] Helps reduce energy consumption and contributes to mitigating the negative environmental impact.
Source: compiled based on LLC "GreenStay Hotels"data.

Table 3. Domestic experience of implementing sustainable practices in business as of 2021

Business	Key sustainable practices in business					
	Utilization of organic raw materials and materials	Reduction of chemical substance usage and their processing cycles	Utilization of renewable materials for packaging and shipping goods	Supporting decent working conditions for employees	Establishment of a recycling and materials reuse program	Engaging consumers in collection points for recycling and reusing raw materials and materials
LLC "Bayadera Logistics"	+*	+	+	-	-	+*
JSC "Farmak"	+	+	+*	+*	-	+*
LLC "TTVK" (TUI Ukraine tour operator)	-	+	+*	+	+	+*
LLC "Bayer"	+*	-	+*	+	+	-
LLC TD "Delta Wilmar"	-	-	+*	+*	+*	-
PJSC "JTI International Ukraine"	+*	+*	+*	-	+	+*
LLC "Metinvest Engineering"	-	+	-	-	+	+
LLC "D&E Evolution"	+	+	+	+*	+	-
LLC "GreenStay Hotels"	-	+*	-	-	+*	-
The prevalence of sustainable practices.	55%	55%	78%	55%	66%	55%

Note:
* Implementation of specific sustainable practices does not require significant expenses or lengthy preparation periods.
Source: compiled based on data from economic entities

environmental impact and fostering sustainable development through energy regeneration, energy efficiency, waste management, ecological construction, education, and personnel engagement. The outlined approach to integrating green technologies into business creates opportunities for the swift implementation of sustainable practices that allow the specific concept realization. This concept revolves around advancing the business while considering its impact on the environment, society, and the economy.

Steel practices in domestic business are also relevant (they are a logical extension of the implementation of green technologies). In particular, the key aspects of implementing sustainable practices in business are:

1. Economic sustainability encompasses conducting business with approaches such as long-term planning, efficient risk and cost management, diversification, and the development of new sources of revenue.

2. Social responsibility involves fostering relationships with stakeholders (employees, clients, community organizations, etc.), ensuring diversity, equity, and employee safety, just like contributing to community social development.

3. Environmental sustainability involves reducing the impact of business activities on the environment, utilizing renewable resources, minimizing emissions of harmful substances, and addressing waste management issues.

Thus, modern business is entering a new era where efforts toward a balanced integration of economic, social, and environmental objectives become pivotal for its success and competitiveness. This is evidenced by the fact that there are already numerous examples of implementing sustainable practices in domestic businesses (Table 3).

Moreover, in many cases, sustainable practices implementation does not require significant expenses or lengthy preparation periods. Instead, it can yield numerous benefits from the outset (such as cost reduction, attracting investments, enhancing customer loyalty, and expanding markets). Among the main examples of applying sustainable practices in business, the following can be highlighted:

1. Utilization of organic raw materials and resources involves the use of natural and organic materials for producing goods and services. This approach reduces the impact of harmful chemicals on the environment and human health.

2. Reduction in the usage of chemical substances and their processing cycles involves implementing practices that minimize the use of chemical substances or substitute them with safer alternatives, thereby reducing the adverse impact on the environment.

3. Utilizing renewable materials for packaging and shipping of goods entails the use of materials that can be regenerated or recycled after use. This approach aids in reducing waste volumes and their detrimental impact on the environment.

4. Ensuring dignified working conditions for employees involves providing safety, and fair wages, upholding workers' rights, and establishing social standards.

5. Creating a recycling and reuse program for raw materials and resources in the production of goods and services involves the development and implementation of initiatives for collecting, processing, and utilizing previously used materials. This approach helps reduce costs and environmental impact.

6. Involving consumers in collection points for the recovery and secondary utilization of raw materials and resources in goods and services manufacturing contributes to increasing awareness and promoting environmental responsibility.

In this context, it should be noted that the implementation of the sustainable practice in business creates conditions for sustainable business development, contributing to improving the quality of life in society (through the eco-friendliness of operations, greening of products and services [7]), resource conservation, and balanced growth.

The comprehensive utilization of green technologies and sustainable practices in business ensures its environmental sustainability and positive impact on society and the natural environment, if approaches, strategies, and methods are implemented to achieve economic, social, and environmental objectives, concurrently enhancing the quality of life for the modern generation, preserving opportunities for future generations.

CONCLUSION AND INVESTIGATION PROSPECTS IN SET DIRECTION

The research emphasizes the importance of implementing green technologies and sustainable practices in business to achieve sustainable development and a positive impact on the environment. At the same time, the following conclusions have been drawn:

1. The implementation of green technologies encompasses various directions, including the utilization of renewable energy, efficient resource management, waste management, green logistics, integration of sustainable practices into product design, and many others. This underscores the necessity for a profound reorientation of enterprises towards environmentally responsible approaches.

1. The implementation of green technologies demands more than just technical changes. It involves the transformation of the organization's culture, engaging personnel with new values and approaches, as well as altering strategies and stakeholder interactions.

2. The implementation of green technologies is a logical extension of adopting sustainable practices. Both directions collectively contribute to reducing negative environmental impact, ensuring sustainable development, and facilitating the discovery of new business opportunities.

The prospects for further research lie in developing parameters for assessing the impact of green technology implementation on the financial performance of businesses and on the reputation of the enterprise among clients, partners, and investors.

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