DEVELOPMENT OF GREEN ENTREPRENEURSHIP MODELS BASED ON MARKET SEGMENTATION

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Abstract (English): This article examines the theoretical and methodological foundations for the formation of green entrepreneurship models based on market segmentation. The study substantiates the importance of segmenting consumers according to their level of environmental awareness, income, and behavioral characteristics to develop effective business models within a green economy framework. Market mechanisms for implementing resource-saving technologies and eco-innovations in the context of sustainable development are analyzed.

Keywords: green entrepreneurship, market segmentation, sustainable development, green economy, eco-innovation, business model, competitive advantage.

1. Introduction

In his address at the Abu Dhabi Sustainability Week on April 14, 2026, President of the Republic of Uzbekistan Shavkat Mirziyoyev stated: "2026 has been declared the Year of Environmental Protection and Green Economy in Uzbekistan. Over the next five years, green components will be incorporated into 50% of investment projects, and greenhouse gas emissions are planned to be ***reduced by 35% by 2026."***[1]

[1] *Address by the President of the Republic of Uzbekistan Shavkat Mirziyoyev at the Abu Dhabi Sustainability Week, April 14, 2026. Available at: https://president.uz/en/lists/view/7814*

In the context of global and national economic competition, issues of green economy and sustainability are becoming increasingly important. Alongside economic growth, ensuring environmental responsibility has been elevated to the level of state policy in our country. In this regard, placing market mechanisms at the forefront, segmenting consumers, and developing sustainable entrepreneurship models are among the most critical priorities.

The growing demand for eco-friendly products is encouraging consumers to embrace sustainable consumption. [2] Different consumer groups hold varying attitudes toward green technologies and eco-friendly practices, making marketing segmentation and the development of green markets a necessity.

2. Literature Review

The term "sustainable consumption" (SC) has become increasingly widespread owing to the global expansion of the sustainable development concept. Carrete et al. (2012) identified the relationship between psychological attitude and consumers' consumption of eco-friendly products. [3] R.Y.K. Chan (2001) determined the cultural and psychological factors influencing demand for eco-friendly products and green purchasing behavior.[4]

M.J. Polonsky (1994) defines green marketing as "a set of activities designed to create and facilitate exchanges intended to satisfy human needs while respecting the ecological well-being of all." [5] The literature identifies four core green marketing strategies:

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2 Goal 12: Ensure sustainable consumption and production patterns. United Nations Sustainable Development Goals. Available at: https://www.un.org/sustainabledevelopment/sustainable-consumption-production/

3 Carrete L., Castaño R., Felix R., Centeno E., González E. Green consumer behavior in an emerging economy: confusion, credibility, and compatibility // Journal of Consumer Marketing. 2012. № 29(7). P. 470–481. https://doi.org/10.1108/07363761211274983

4 Chan R.Y.K. Determinants of Chinese consumers' green purchase behavior // Psychology & Marketing. 2001. Vol. 18. № 4. P. 389–413. https://doi.org/10.1002/mar.1013

5 Polonsky M.J. An introduction to green marketing // Electronic Green Journal. 1994. № 1(2). P. 1–10. https://doi.org/10.5070/G31210177

1. Sustainable Design — the full product life-cycle concept, encompassing packaging and waste management;[6]

2. Corporate Social Responsibility (CSR) — heightening attention to social and environmental accountability;

3. Green Pricing — reflecting the costs of eco-friendly production in pricing policy;

4. Sustainable Packaging — a rapidly spreading and increasingly mainstream approach.

Jaiswal et al. (2021) demonstrated the effectiveness of segmenting consumers into "green," "moderately green," and "unintentionally green" groups.[7] The ESG (Environmental, Social, and Governance) approach has become a dominant framework in the business and investment world over the past decade.[8]

3. Research Methods

The following scientific research methods were employed in this study:

1. Scientific abstraction and theoretical analysis — systematizing and generalizing scholarly perspectives on green economy, market segmentation, and business models;

2. Comparative analysis — identifying distinguishing features and advantages by contrasting traditional and green entrepreneurship models;

3. Segmentation analysis — forming target market segments by grouping consumers according to environmental awareness, income, geographic location, and behavioral criteria;

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6 Prakash A. Green Marketing, Public Policy and Managerial Strategies // Business Strategy and the Environment. 2002. Vol. 11. № 5. P. 285–297. https://doi.org/10.1002/bse.338

7 Jaiswal D., Kaushal V., Singh P.K., Biswas A. Green market segmentation and consumer profiling: a cluster approach to an emerging consumer market // Benchmarking: An International Journal. 2021. Vol. 28. № 3. P. 792–812. https://doi.org/10.1108/BIJ-05-2020-0247

8 Smirnov V.D. ESG risk management in commercial organizations // Management Sciences. 2020. Vol. 10. № 3. P. 6–20. https://doi.org/10.26794/2404-022X-2020-10-3-6-20

4. Statistical analysis — evaluating development trends in green economy and eco-innovation using national and international statistical data;

5. Systems approach — enabling a comprehensive study of green entrepreneurship in relation to market infrastructure and state policy.

4. Analysis and Results

Sustainable consumption is closely linked to sustainable production and a responsible lifestyle. For business, it serves as a driving force for increasing productivity, achieving sustainable economic growth, and creating new jobs.

Table 1. Elements of harmonizing economic security and green economy from a sustainable development perspective

Element	Resource	Objective	Mechanism
Environmental	Natural capital	Environmental security, nature conservation	Green business models and ESG criteria
Economic	Physical capital	Lean production, business continuity	ISO standards and quality management systems
Social	Human capital	Poverty alleviation and responsible consumption	Developing ecological culture and social programs

Analysis of energy efficiency indicators across the regions of Uzbekistan shows that the national average stands at 4.2%. The highest efficiency levels are recorded in Tashkent city (8.0%), Navoiy region (7.4%), and the Republic of Karakalpakstan (6.4%). The lowest figures are observed in Andijan (1.3%), Bukhara (2.1%), and Samarkand regions (2.2%).[9]

9Data of the National Statistics Committee of the Republic of Uzbekistan. Available at: https://stat.uz

The national economy remains heavily dependent on conventional fuel sources, which account for 53.2% of total energy consumption. The share of electricity is 41.0%, while heat energy accounts for 5.8%.

Table 2. Comparative analysis of regional disparities

Indicator	Highest region	Lowest region	Difference
Energy efficiency	Tashkent region (8.0%)	Andijan region (1.3%)	6.1×
Fuel share	Republic of Karakalpakstan (79.1%)	Fergana region (27.9%)	2.8×
Electricity share	Sirdaryo region (69.6%)	Republic of Karakalpakstan (20.3%)	3.4×

The volume of municipal solid waste per capita is growing as a result of urbanization and shifts in consumption culture. In major cities, daily waste generation amounts to 0.8–1.1 kg per person, while in rural areas the figure is 0.4–0.6 kg per person. Currently, only approximately 25–30% of generated waste is directed toward recycling. According to Uzbekistan's strategy through 2028, the goal is to recycle at least 60% of municipal solid waste.[10]

Table 3. Indicators for assessing green production potential

Indicator	Current status	Potential level
Energy efficiency	Average efficiency: 4.2%	High (30–40% savings possible through

		modernization)
Share of renewable energy (RE)	Approaching ~10% of total balance	Strategic target: 25–27 GW by 2030
Water-saving technologies	25–30% coverage in agriculture	Very high (drip irrigation systems)
Waste recycling	Approximately 25–30%	High (potential up to 60%)

The regions of Uzbekistan can be divided into three main groups according to their green production potential:

A. Renewable Energy (RE) hubs — Navoiy and Bukhara (wind and solar parks); Surkhandarya and Kashkadarya (high solar radiation levels);

B. Green industrial and recycling zones — Tashkent city and region (municipal and industrial waste recycling, electric vehicle production); Fergana Valley (circular economy models);

C. Green agriculture and bioenergy — Khorezm and the Republic of Karakalpakstan (Aral Sea region ecological restoration, salt-resistant crops).

Green marketing offers companies a number of strategic advantages: building brand trust; accessing new green market segments; achieving long-term sustainable growth; gaining competitive advantage; creating opportunities for innovation; increasing profitability; and contributing to environmental protection.[11]

Uzbekistan's first sovereign ESG report was published in 2021. From 2022, ESG principles began to be implemented at enterprises such as Navoiyuran. In 2023, the first seminar on integrating ESG principles into investor relations was

11 Antonova N.V., Lomakina N.V. The green economy model and its implementation in resource regions // Regionalistika. 2019. Vol. 6. № 5. P. 31–49. https://doi.org/10.14530/reg.2019.5.31

held in Tashkent. These developments demonstrate that the ESG concept is not merely a strategic direction but a system that is actively being put into practice.[12]

5. Conclusions and Recommendations

Based on the research findings, the following conclusions can be drawn:

1. Responsible (sustainable) consumption remains insufficiently studied both in practice and in theory.[13] Educational measures are needed for the business community in the areas of green marketing and the impact of ESG factors on evolving business models.

2. It is necessary to develop a national "Labor Productivity" project covering all regions of the Republic of Uzbekistan. The proposed sustainable production and consumption tools, when implemented at the level of regional industrial enterprises, will help strengthen regional economies and increase the number of enterprises with export potential for eco-friendly products.[14]

3. The use of indicative analysis tools makes it possible to prioritize the implementation of ESG principles in specific regions of Uzbekistan, with the aim of developing particular segments of the green economy and ensuring economic security. It is essential to introduce a "Green Passport" system in each region, under which the carbon emission levels and renewable energy potential of each territory would be continuously monitored.

Foreign investor interest in regions that have adopted green technologies is 2–3 times higher. This is particularly significant in the context of the European Union's Carbon Border Adjustment Mechanism (CBAM). The main challenges are

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13 Schill M., Godefroit-Winkel D. Consumer segments in the smart environmental objects market // Journal of Consumer Marketing. 2019. Vol. 36. № 2. P. 317–327. https://doi.org/10.1108/JCM-12-2017-247

14 Barysheva G.A., Egorova M.S. Green technologies: definition, stages of development and role in sustainable economic development // Theory and Practice of Social Development. 2019. № 12(142). P. 48–54. https://doi.org/10.24158/tipor.2019.12.8

the high initial cost of green technologies and a shortage of qualified personnel — addressing these issues requires the joint efforts of the public and private sectors.

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