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Article

Development of Green Entrepreneurship Models Based on Market Segmentation

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Abstract: Developing green entrepreneurship models requires business strategies that integrate environmental responsibility with market demand and regional production capabilities. This study examines the theoretical and methodological foundations for shaping green entrepreneurship models through market segmentation. It considers consumer differentiation according to environmental awareness, income, purchasing behaviour and geographical characteristics, and analyses how these factors can inform the selection of value propositions, production technologies and marketing approaches. The study applies theoretical analysis, comparative analysis, segmentation, descriptive statistical analysis, and a systems approach. The analysis also considers regional differences in energy structure, household waste generation, recycling and the potential for green production in Uzbekistan. The findings indicate that green entrepreneurship should not rely on a uniform business model: renewable-energy-oriented regions, industrial and recycling centres, and areas with potential for green agriculture and bioenergy require differentiated approaches. A conceptual framework is proposed linking consumer segments, resource-saving production, eco-innovation and value creation. The study recommends developing regional green profiles, strengthening environmental awareness and business capabilities, and using targeted incentives to support sustainable production and consumption.

Keywords: green entrepreneurship, market segmentation, sustainable consumption, green economy, eco-innovation, ESG, resource efficiency, business model, Uzbekistan.

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1. Introduction

The transition towards a green economy has become an important component of national and global development strategies. Economic growth is increasingly expected to be accompanied by environmental responsibility, more efficient use of natural resources and reductions in the negative effects of production and consumption. In his speech at the Abu Dhabi Sustainability Week summit on 14 January 2025, the President of the Republic of Uzbekistan highlighted the country's long-term low-carbon development strategy and the intention to introduce green components into investment projects and reduce greenhouse gas emissions by 2030 [1]. These priorities increase the importance of business models capable of combining economic performance with environmental objectives.

At the enterprise level, the transition to green production is closely connected with changes in consumer demand. Growing interest in environmentally friendly products encourages businesses to reconsider product design, packaging, sourcing, production technologies and communication with customers. However, consumers do not form a homogeneous market. Their environmental awareness, income, purchasing motives and

readiness to pay for environmentally preferable products may differ considerably. Therefore, market segmentation is essential for identifying target groups and developing business models that respond to their expectations.[2]

Green entrepreneurship involves more than promoting products as environmentally friendly. It also requires the integration of resource-saving technologies, responsible production practices, waste reduction, recycling and environmental innovation into the value-creation process. Green marketing and ESG-oriented management can support this transition, provided that environmental claims are connected with actual changes in business operations [3].

The purpose of this study is to examine how market segmentation can be used to develop green entrepreneurship models in Uzbekistan. The study focuses on the relationship between consumer characteristics, regional production potential and the selection of appropriate business strategies. Its contribution is a conceptual framework that connects market segments with differentiated green business models and regional resource conditions.[4]

The concept of sustainable consumption has become increasingly prominent alongside the expansion of the sustainable development agenda. Sustainable consumption is generally associated with meeting human needs while using natural resources efficiently and limiting adverse environmental effects [5]. This approach links consumer behaviour with the organisation of production and the long-term sustainability of economic activity.

Research on green consumer behaviour emphasises that purchasing decisions are influenced not only by product characteristics and price, but also by psychological, cultural and informational factors. Carrete et al. examine the relationship between consumer attitudes and the purchase of environmentally friendly products in an emerging economy [6]. Chan identifies cultural and psychological determinants of green purchasing behaviour [7]. These findings suggest that businesses need to understand the motivations and perceptions of different consumer groups rather than address the market as a single category.

Green marketing provides a means of aligning a company's market activities with environmental objectives. Polonsky and Mintu-Wimsatt consider environmental marketing in terms of strategies, practices and research, while later work describes green marketing as a set of activities that facilitate exchanges in ways that respect environmental well-being [8]. In practice, green marketing can focus on communicating the environmental benefits of products, but it can also reflect deeper operational changes, including cleaner technologies, resource efficiency and environmental management.

An important contribution to this field is the segmentation of green consumers according to their environmental orientation. Jaiswal et al. apply a cluster-based approach to green market segmentation and consumer profiling, distinguishing groups with different levels of environmental engagement and identifying cognitive factors such as environmental concern, knowledge, perceptions of eco-labels and eco-brands, and green purchasing intentions [9]. Such approaches provide a basis for matching business offers to consumer profiles.

The literature also highlights the role of public policy and managerial strategies in supporting green marketing and sustainable production [10]. Studies of green technologies and regional development emphasise the importance of resource availability, industrial structure and the capacity of local economies to adopt environmentally oriented innovations [11]. Nevertheless, the application of market segmentation to the formation of differentiated green entrepreneurship models remains an important practical task for regional economies, including Uzbekistan.

Based on the reviewed literature, this study treats market segmentation as a strategic link between consumer demand and the operational design of green businesses. The proposed approach combines consumer-level characteristics with regional conditions, rather than considering marketing decisions separately from production capabilities.

2. Materials and Methods

The study uses a qualitative and descriptive-analytical design. It does not report the results of a primary consumer survey or an econometric estimation. Instead, it systematises the theoretical literature and analyses the regional indicators and descriptive statistics presented in the source material in order to develop a conceptual framework for green entrepreneurship.

2.1. Research methods

The following methods were used:

a. Scientific abstraction and theoretical analysis — to systematise academic approaches to the green economy, market segmentation, sustainable consumption and business models.
b. Comparative analysis — to identify differences between conventional entrepreneurship models and green entrepreneurship models, particularly in their treatment of resources, environmental impacts and value creation.
c. Market-segmentation analysis — to organise consumer characteristics around environmental awareness, income, geographical location and purchasing behaviour, and to identify the implications of these characteristics for target-market selection.
d. Descriptive statistical analysis — to interpret the regional indicators and waste-generation figures presented in the source material.
e. Systems approach — to examine green entrepreneurship in relation to market infrastructure, public policy, investment conditions and regional production potential.
f. Induction and deduction — to move between general theoretical propositions and practical recommendations for the development of green business models.

2.2. Dimensions of market segmentation

For the Table 1. purposes of the proposed framework, the market is segmented using four interrelated dimensions: (i) environmental awareness and concern; (ii) income and purchasing capacity; (iii) purchasing behaviour and readiness to choose environmentally preferable products; and (iv) geographical and regional context. These dimensions are not treated as statistically estimated clusters in this study. They form an analytical basis for designing differentiated value propositions and business responses.

Tabel. 1. Key Dimensions of Market Segmentation and Their Implications for Green Entrepreneurship Models [12]

Segmentation dimension	Main characteristics considered	Implication for green businesses
Environmental awareness	Environmental concern, knowledge, trust in eco-labels and eco-brands	Provide credible environmental information, certification and transparent product communication
Income and purchasing capacity	Ability and willingness to pay, price sensitivity	Offer differentiated product lines and balance environmental performance with affordability
Purchasing behaviour	Purchase frequency, preference for sustainable products, willingness to change habits	Use targeted marketing, convenient distribution and incentives for responsible consumption

Segmentation dimension	Main characteristics considered	Implication for green businesses
Geographical context	Urban/rural setting, regional resource base, infrastructure and production specialisation	Adapt sourcing, production technologies and logistics to regional conditions

2.3. Conceptual approach to green business-model formation

The proposed approach links the identified consumer segments with the enterprise's operational choices. First, a business identifies the needs and environmental expectations of its target consumers. Second, it formulates a value proposition that reflects those expectations. Third, it selects resource-saving technologies, materials, packaging and waste-management practices consistent with the value proposition. Fourth, it communicates verifiable environmental benefits through appropriate marketing channels. Finally, it monitors economic and environmental outcomes and adjusts the model in response to market feedback.

Accordingly, the conceptual sequence can be expressed as: consumer and regional analysis → target-segment selection → green value proposition → resource-efficient production and eco-innovation → green marketing and distribution → performance monitoring and model adjustment.

3. Results

3.1. The role of sustainable consumption and ESG in green entrepreneurship

Sustainable consumption and sustainable production are interdependent. Responsible production can reduce the environmental burden associated with business activity, while responsible consumption creates market incentives for products and services with lower environmental impacts. For enterprises, this transition can also support productivity, long-term growth and employment creation in the regions where they operate [13].

ESG principles provide a broader framework for integrating environmental, social and governance considerations into corporate decision-making. In this context, green entrepreneurship should not be limited to a promotional strategy. It should be reflected in the selection of technologies, the use of energy and water, waste management, labour practices and the transparency of corporate governance. A company's environmental positioning is more credible when its marketing claims are supported by measurable operational practices.

The Table 2. regional context is particularly important in Uzbekistan because energy structures, industrial specialisation, natural resources and infrastructure differ across territories. The regional comparisons presented in the source material illustrate these differences.

Table 2. Regional Differences in Energy Structure and Energy Efficiency in Uzbekistan[14]

Indicator	Region with the highest reported value	Region with the lowest reported value	Reported difference
Energy efficiency	Tashkent Region (8.0%)	Andijan Region (1.3%)	6.1 times

Indicator	Region with the highest reported value	Region with the lowest reported value	Reported difference
Share of fuel	Republic of Karakalpakstan (79.1%)	Fergana Region (27.9%)	2.8 times
Share of electricity	Syrdarya Region (69.6%)	Republic of Karakalpakstan (20.3%)	3.4 times

These figures suggest that a uniform green-production strategy may not be equally appropriate for all regions. Territories with a high share of fuel in their energy balance have a strong incentive to diversify energy sources and expand renewable-energy use. Regions with a comparatively high electricity share may have different priorities concerning the efficiency, reliability and environmental characteristics of electricity supply. The figures should therefore be interpreted as indicators of differing regional conditions, rather than as a complete ranking of regional sustainability.

3.2. Household waste generation and opportunities for circular business models

Changes in urbanisation and consumption patterns affect the volume and composition of household waste. The source material reports differences between urban and rural areas in per-capita waste generation, as summarised in Table 3.

Table 3. Per Capita Household Waste Generation in Urban and Rural Areas of Uzbekistan [15]

Area category	Territorial description	Daily generation (kg/person)	Annual generation (kg/person)
Urban areas	Large cities, including Tashkent and regional centres	0.8–1.1*	300–400
Rural areas	District centres and villages	0.4–0.6	150–220
Republic-wide average	Average reported indicator	0.65–0.75	240–270

*The original source document states “0.8–11 kg” for the daily urban figure. The range has been rendered here as “0.8–1.1 kg” only as a probable typographical interpretation; this value must be checked against the original statistical source before publication.

According to the source material, organic waste accounts for approximately 35–45% of total household waste and mainly consists of food and garden waste. Paper and cardboard account for 10–15%, while plastics and PET products account for 10–12%. Glass and metal are reported at 5–8%. These categories indicate opportunities for differentiated circular-economy activities, including organic-waste composting, recycling of paper and plastics, and the recovery of reusable materials.

The source also reports that waste collection services cover more than 90% of the population, while only around 25–30% of generated waste is directed to recycling. This gap points to opportunities for enterprises specialising in sorting, collection, recycling, composting and the production of secondary raw materials. The source refers to a national target of increasing household-waste recycling to at least 60% by 2028; the relevant policy document should be cited explicitly in the final publication.

3.3. Regional potential for green production

The Table 4. regional green-production potential described in the source material can be grouped into three broad categories. This classification is analytical and is intended to support the selection of business models in line with regional conditions.

Table 4. Regional classification of green production potential and promising green business directions in Uzbekistan[16]

Regional group	Territories and resource characteristics described in the source	Potential green business directions
Renewable-energy centres	Navoi and Bukhara: potential for wind and solar parks; Surkhandarya and Kashkadarya: high solar radiation	Solar and wind energy projects, energy services, green hydrogen-related value chains, solar panels and heat pumps
Green industry and recycling zones	Tashkent city and region: large market and technological base for municipal and industrial waste processing; Fergana Valley: dense small and medium-sized business base	Waste sorting and recycling, circular-economy services, resource-efficient manufacturing, greener transport-related supply chains
Green agriculture and bioenergy	Khorezm and the Republic of Karakalpakstan: ecological restoration potential, shelterbelts and salt-tolerant crops	Sustainable agriculture, biomass use, bioenergy, restoration-related services and resource-efficient agricultural production

This regional grouping indicates that the content of green entrepreneurship differs according to local resource endowments and economic specialisation. In areas with high renewable-energy potential, business models can be built around energy generation and related services. In industrial and urban areas, waste recovery and resource-efficient production may offer more immediate opportunities. In agricultural territories, green business models can be linked to water-saving technologies, soil restoration, biomass and sustainable farming.

3.4. Indicators for assessing green-production opportunities

The source material identifies four indicators for assessing green-production opportunities: energy efficiency, the share of renewable energy, the coverage of water-saving technologies and the recycling of waste. The reported current conditions and potential are summarised in Table 5 of the original article and reproduced below with adjusted numbering.[17]

Table 5. The original article and reproduced below with adjusted numbering

Indicator	Current situation reported in the source	Potential / strategic direction reported in the source
Energy efficiency	Industrial energy use remains high; average efficiency is reported as 4.2%	Modernisation could enable savings of 30–40%
Renewable-energy share	Approaching 10% of the total balance	Strategic objective: reach 25–27 GW by 2030

Indicator	Current situation reported in the source	Potential / strategic direction reported in the source
Water-saving technologies	Coverage in agriculture: 25–30%	High potential, particularly through drip-irrigation systems
Waste recycling	Approximately 25–30%	Potential to increase recycling to up to 60%

The indicators show that the green-production agenda combines technological, infrastructural and organisational challenges. The source identifies the high initial cost of green technologies and the shortage of qualified personnel as major barriers. These constraints can be addressed through access to finance, technical support, workforce training, cooperation between enterprises and research institutions, and predictable public incentives.

3.5. A market-segmentation-based framework for green entrepreneurship

Combining the consumer and regional analyses makes it possible to formulate a differentiated framework for green entrepreneurship. The Table 6. framework does not assume that all consumers are willing to pay the same premium or that all regions have identical production capabilities. Instead, it matches consumer expectations with the feasible environmental and economic characteristics of local production.[18]

Table 6. A market-segmentation-based framework for green entrepreneurship

Target-market orientation	Value proposition	Business-model priorities
Highly environmentally aware consumers	Verifiable environmental performance, traceability, recognised certification and transparent information	Certified products, eco-labels, low-impact packaging, transparent supply chains and premium or specialised product lines
Moderately environmentally aware consumers	A balance between price, quality, convenience and environmental benefits	Affordable green alternatives, clear product information, retail partnerships and gradual product-line expansion
Price-sensitive or less environmentally engaged consumers	Practical benefits, affordability, durability and convenience, with environmental improvements embedded in the product	Resource-efficient production, cost reduction, durable products, accessible distribution and simple environmental communication
Regionally specialised markets and business customers	Reliable access to locally appropriate green inputs, services and technologies	Renewable energy, recycling, water-saving technologies, circular supply chains and region-specific partnerships

The proposed framework implies that market segmentation should inform more than advertising. It should influence product development, production planning, sourcing, packaging, pricing, distribution and after-sales communication. For example, a business targeting environmentally aware consumers may prioritise certification and traceability, whereas a business serving price-sensitive consumers may focus first on reducing material and energy costs so that greener products remain affordable.

3.6. Policy and managerial implications

Several practical implications follow from the analysis. First, enterprises need access to reliable information about consumer preferences and environmental awareness. Second, regional green-production potential should be mapped and monitored through a regional 'Green Passport' system that records relevant information on emissions, renewable-energy resources, water use and waste management. Third, business support should address the high initial costs of green technologies and the shortage of skilled personnel. Fourth, public procurement can create demand for environmentally preferable products and encourage firms to improve their production processes. Finally, training programmes should strengthen knowledge of green marketing, ESG principles, resource efficiency and sustainable business-model design.[19]

The study has several limitations. First, it is based on theoretical analysis and descriptive regional indicators rather than a primary survey of consumers or firm-level data. Therefore, the proposed consumer segments and business-model links should be treated as a conceptual framework, not as statistically validated market clusters. Second, some regional and waste-related figures in the source material require verification against the original statistical publications, including the reported daily urban waste range and the basis for selected energy-efficiency indicators. Third, the source material does not provide a complete time series or detailed methodological definitions for every regional indicator, which limits the possibility of assessing changes over time.

Future research could test the proposed framework through consumer surveys and cluster analysis, estimate willingness to pay for environmentally friendly products, and compare green business-model performance across regions and sectors. Further work could also develop a regional composite index using transparent indicator definitions and documented weighting procedures. Such research would help establish which combinations of consumer characteristics, regional resources and policy incentives are most strongly associated with the adoption and commercial viability of green entrepreneurship models.[20]

4. Discussion

The findings suggest that market segmentation can guide the design of green business models in Uzbekistan by linking what consumers value with what enterprises can deliver under local production conditions. This interpretation is consistent with Jaiswal et al., who identified differences in environmental engagement, product knowledge, and perceptions of eco-labels among consumers in an emerging market [9]. In the proposed framework, traceability and credible certification are particularly relevant to environmentally engaged consumers, while affordability, durability, and convenient access may carry greater weight for price-sensitive buyers. Regional conditions shape how firms can deliver these benefits. The renewable-energy potential of Navoi and Bukhara points to opportunities for clean-energy services, while the concentration of customers and industrial activity in Tashkent provides a basis for exploring waste sorting and recycling services. In both cases, the credibility of the value proposition depends on whether firms can substantiate their environmental claims through measurable changes in energy use, material consumption, or waste generation [16]. Because the study draws on literature and descriptive regional indicators, the proposed segments and business-model matches remain hypotheses for testing with consumer purchasing data and firm-level performance measures.

5. Conclusion

The study demonstrates the importance of market segmentation for the development of green entrepreneurship models. Consumers differ in environmental awareness, income, purchasing behaviour and geographical context; consequently, businesses need differentiated value propositions and operational strategies. Green entrepreneurship is most effective when environmental claims are supported by resource-saving technologies,

responsible production, waste reduction and credible environmental information. The regional analysis indicates that Uzbekistan's green-production opportunities are unevenly distributed. Renewable-energy potential, industrial and recycling capacity, and opportunities in green agriculture and bioenergy call for different regional business models. The reported waste composition and recycling gap also point to opportunities for circular-economy enterprises, particularly in sorting, recycling and the recovery of organic materials. Based on these findings, the following recommendations are proposed: (i) develop market research and consumer-segmentation practices among enterprises; (ii) match green business models with regional resource and infrastructure conditions; (iii) introduce regional Green Passports for monitoring environmental and production potential; (iv) expand financial, technical and educational support for resource-saving technologies; and (v) use public green procurement and transparent environmental standards to stimulate demand. The implementation of these measures can strengthen regional economic resilience, support customer-oriented enterprises and expand the market for environmentally preferable products.

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