

THE IMPORTANCE AND PROSPECTS OF TRANSITIONING TO A GREEN ECONOMY IN THE ECONOMIC DEVELOPMENT OF UZBEKISTAN

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Abstract: This scientific article analyzes the strategic importance, core structural mechanisms, and long-term prospects of transitioning to a green economy in the Republic of Uzbekistan. Amidst accelerating global climate volatility and regional environmental challenges, diversifying the economic infrastructure away from intensive resource extraction toward ecological and energy-efficient alternatives has become a national imperative. Using multi-sectoral econometric trend estimation and qualitative comparative framing, the study explores the foundational pathways of national green modernization. Key focus areas include scaling renewable energy integration, reducing greenhouse gas (GHG) emission intensity per unit of GDP, modernizing transport systems, and embedding eco-efficient technologies within primary manufacturing sectors. The paper analyzes three macro-economic scenarios: Business-As-Usual (BAU), Moderate Green Transition (MGT), and Aggressive Decarbonization and Diversification (ADD). The findings indicate that implementing aggressive green reforms serves as a catalyst for sustainable economic growth, enhances long-term export competitiveness on international markets, and generates sustainable high-tech employment opportunities. Ultimately, the paper provides a cohesive series of actionable structural recommendations for integrating comprehensive tax-incentive architectures, specialized institutional frameworks, and targeted professional training to fully achieve the goals outlines in the national Green Economy Transition Strategy.

Keywords: Green economy, Uzbekistan, Sustainable development, Renewable energy, GDP intensity, Eco-efficiency, Economic diversification, Macroeconomic modeling.

Özet. Bu bilimsel makalede, Özbekistan Cumhuriyeti'nde yeşil ekonomiye geçişin stratejik önemi, temel yapısal mekanizmaları ve uzun vadeli perspektifleri analiz edilmektedir. Hızlanan küresel iklim istikrarsızlığı ve bölgesel çevresel zorluklar karşısında, ekonomik altyapının yoğun kaynak tüketiminden çevre dostu ve enerji tasarruflu alternatiflere doğru çeşitlendirilmesi ulusal bir zorunluluk haline gelmiştir. Çok sektörlü ekonometrik trend tahmini ve nitel karşılaştırmalı çerçeveleme yöntemlerini kullanan bu çalışma, ulusal yeşil modernleşmenin temel yollarını incelemektedir. Öne çıkan temel alanlar arasında yenilenebilir enerji entegrasyonunun artırılması, GSYİH başına düşen sera gazı emisyon yoğunluğunun azaltılması, ulaşım sistemlerinin modernize edilmesi ve birincil imalat sektörlerinde eko-etkin teknolojilerin yaygınlaştırılması yer almaktadır. Çalışmada üç makroekonomik senaryo analiz edilmiştir: Mevcut Durumun Devamı (BAU), Ilımlı Yeşil Geçiş (MGT) ve Radikal Karbonsuzlaşma ve Çeşitlendirme (ADD). Bulgular, radikal yeşil reformların uygulanmasının sürdürülebilir ekonomik büyüme için bir katalizör görevi gördüğünü, uluslararası pazarlarda uzun vadeli ihracat rekabet gücünü artırdığını ve sürdürülebilir yüksek teknoloji istihdam alanları yarattığını göstermektedir.

Sonuç olarak makale, ulusal Yeşil Ekonomi Geçiş Stratejisi hedeflerine tam olarak ulaşılması amacıyla kapsamlı vergi teşvik mimarilerinin, özel kurumsal çerçevelerin ve hedeflenen mesleki eğitimin entegrasyonuna yönelik eyleme geçirilebilir yapısal öneriler sunmaktadır.

Anahtar Kelimeler: Yeşil ekonomi, Özbekistan, Sürdürülebilir kalkınma, Yenilenebilir enerji, GSYİH yoğunluğu, Eko-etkinlik, Ekonomik çeşitlendirme, Makroekonomik modelleme.

1. INTRODUCTION

In the contemporary era of global economic restructuring, the transition from resource-intensive development paradigms to environmentally sustainable model—broadly encapsulated under the term 'green economy'—has transformed from an elective ethical alignment to a foundational structural necessity. Historically, macroeconomic paradigms heavily prioritized linear expansion vectors, treating natural resource reserves as infinite endowments and atmospheric sinks as unconstrained waste repositories. However, the manifestation of critical planetary boundaries, acute climate change anomalies, accelerated biodiversity loss, and systemic ecological degradation has fundamentally invalidated the viability of unrestricted industrial models. For emerging economies, particularly those located within geographically vulnerable landlocked regions, the perils of climate change are not abstract future configurations but immediate disruptions affecting agricultural productivity, public health infrastructure, resource availability, and macroeconomic equilibrium.

The Republic of Uzbekistan presents an extraordinarily compelling and critical case study within this global structural pivot. Situated in the heart of Central Asia, Uzbekistan has historically operated on an economic model characterized by intensive cotton cultivation, extensive mineral resource extraction, and a high reliance on fossil fuels, particularly natural gas, for its centralized power generation grid and industrial processing facilities. While this structural configuration catalyzed initial decades of post-independence industrialization and sustained basic macroeconomic output, it simultaneously bequeathed an intense ecological liability. The Aral Sea disaster, widely acknowledged as one of the most devastating anthropogenic environmental catastrophes of the modern era, stands as a stark testament to the limits of unconstrained resource extraction and ecologically blind economic planning. Furthermore, contemporary climatic assessments indicate that Central Asia is warming at a rate significantly exceeding the global average, exacerbating chronic water scarcity, driving widespread soil salinization, increasing the frequency of severe dust storms, and threatening the fundamental baseline of regional food and energy security.

Recognizing these interlocking ecological and macroeconomic vulnerabilities, the leadership of Uzbekistan has initiated an ambitious, multi-decade structural overhaul designed to decoupling economic growth from environmental degradation. The formal institutional genesis of this pivot was crystallized via the adoption of the 'Strategy for the Transition of the Republic of Uzbekistan to a Green Economy for the Period 2019–2030'. This comprehensive legislative framework outlines a rigorous blueprint aimed at systematically reducing greenhouse gas emissions relative to Gross Domestic Product (GDP), modernizing the national industrial core via the infusion of energy-efficient and clean technologies, scaling up renewable energy installations, optimizing agricultural water-use mechanics, and fostering an innovative domestic market for green technologies and financial instruments.

The transition to a green economy within Uzbekistan is explicitly not conceptualized as a defensive ecological mitigation strategy; rather, it is designed as a proactive offensive mechanism for comprehensive economic development and long-term diversification. In an increasingly protectionist and environmentally conscious international trading environment, characterized by the impending deployment of cross-border carbon adjustment mechanisms (such as the European Union's Carbon Border Adjustment Mechanism - CBAM), national economies that fail to decarbonize their export-oriented industrial sectors face systemic marginalization from high-value global supply chains. Thus, the integration of green technologies directly underpins the future export competitiveness of Uzbekistan's primary industrial sectors, including metallurgy, chemical manufacturing, textiles, and agricultural goods. Moreover, the massive infrastructural investments required to remodel the national energy matrix present a historic opportunity to attract foreign direct investment (FDI), stimulate advanced domestic research and development, and generate thousands of high-skill, sustainable 'green jobs' across the nation's provinces, particularly within historically underdeveloped rural areas.

Despite the clear strategic alignment, the operational path toward a comprehensive green transition in Uzbekistan is mediated by deep-seated structural rigidities, capital constraints, path dependencies in institutional governance, and technical bottlenecks in grid infrastructure. Navigating this complex transition requires a deep, scientifically rigorous analysis of the underlying economic dynamics, macro-environmental tradeoffs, and sector-specific policy levers. Therefore, the primary objective of this scientific article is to evaluate the systemic importance, contemporary structural impacts, and long-term macroeconomic prospects of transitioning to a green economy in Uzbekistan. By deploying multi-sectoral econometric modeling and quantitative comparative scenarios, this study aims to provide a robust analytical framework that evaluates how alternative policy tracks influence GDP growth, energy consumption profiles, and atmospheric emission vectors, ultimately delivering actionable, empirically grounded recommendations to optimize the nation's green development trajectory.

2. METHODOLOGY

To rigorously evaluate the multi-dimensional impacts and long-term trajectories of the green economy transition in Uzbekistan, this study employs a hybrid analytical methodology that integrates multi-sectoral econometric trend estimations with quantitative structural scenario analysis. The primary analytical engine of the research consists of a custom-parameterized Macroeconomic Resource and Emissions Model (MREM), designed to trace the complex feedback loops operating between industrial output, energy consumption, technology-specific capital accumulation, and greenhouse gas emission profiles within the distinct context of the Uzbek national economy.

The data baseline utilized to parameterize the MREM model spans a fifteen-year historical horizon, drawing on comprehensive macro-financial and environmental data streams. Primary data regarding sectoral GDP contributions, public and private capital formation, employment structures, and international trade volumes were extracted from the official databases of the Statistics Agency under the President of the Republic of Uzbekistan. Corresponding environmental and energy data, including total primary energy supply (TPES), technology-specific power generation profiles, transmission grid loss coefficients, and gas-specific emissions inventories, were compiled from the Ministry of Energy, the Ministry of Economy and Finance,

and verified international climate repositories, including the International Energy Agency (IEA) and the World Bank's World Development Indicators (WDI). All financial values were converted to a constant pricing baseline to eliminate inflationary distortions and ensure long-term mathematical consistency.

The mathematical framework of the model treats the national economy as an interconnected system composed of five primary macro-sectors: (1) Industrial Manufacturing and Heavy Metallurgy; (2) Agriculture, Water Resource Management, and Forestry; (3) Transport, Logistics, and Urban Infrastructure; (4) Electricity, Gas, and Thermal Power Generation; and (5) Commercial Services and Residential Infrastructure. Within each sector, production outputs are modeled utilizing an expanded transcendental logarithmic (translog) production function that incorporates traditional capital and labor inputs alongside explicit vectors for fossil-fuel energy inputs, renewable energy components, and an endogenous technology coefficient representing the systemic 'eco-efficiency' level. The basic structural form of the sectoral emission vector is derived via an adjusted Intergovernmental Panel on Climate Change (IPCC) Tier 1 accounting identity, which maps sector-specific fuel combustion and industrial process volumes to corresponding greenhouse gas emission equivalents.

To project the future trajectory of Uzbekistan's economic development over the horizon leading to 2035, the methodology establishes three highly distinct, mutually exclusive structural scenarios, each governed by an explicitly defined set of policy behaviors, institutional conditions, and capital allocation frameworks: 1. Business-As-Usual (BAU) Scenario: This track assumes a strict preservation of the historical status quo. Economic growth is driven by historical, resource-intensive investment patterns, with the industrial core maintaining its current reliance on natural gas and coal. Institutional mandates for decarbonization remain unenforced, and renewable energy adoption is limited to projects already fully constructed, without further expansion of grid integration capabilities. 2. Moderate Green Transition (MGT) Scenario: This track models the linear, partial implementation of the national 2019–2030 strategy targets. It presumes a steady but non-disruptive phase-in of solar and wind generation assets, reaching a 25% share in the national power mix by 2030. Industrial energy efficiency gains are driven by standard capital replacement cycles, and water-saving agricultural technologies are deployed primarily across high-priority irrigation networks. 3. Aggressive Decarbonization and Diversification (ADD) Scenario: This track models an intensive, highly synchronized structural transformation characterized by aggressive regulatory intervention, substantial fiscal restructuring, and massive public-private capital reallocation. It simulates the total removal of fossil-fuel subsidies, the introduction of a localized carbon-pricing mechanism, the rapid scale-up of renewable energy installations to exceed 40% of grid capacity by 2030, deep structural retrofitting of all heavy manufacturing infrastructure, comprehensive electrification of the national logistics grid, and widespread deployment of automated digital drip-irrigation networks across all agricultural zones.

The computational simulation of these scenarios was executed utilizing numerical integration algorithms over annual time steps. The model incorporates dynamically adjusting equilibrium constraints, ensuring that total electricity generation matches industrial and residential demand curves, while factoring in grid stability limitations and technology-specific capacity factors. Sensitivity testing was systematically applied to critical exogenous variables, including

international market prices for natural gas, global equipment costs for solar photovoltaic and wind turbine assemblies, and domestic population growth rates, thereby guaranteeing the structural validity and econometric reliability of the resulting long-term projections.

3. RESULTS

The quantitative simulations generated by the Macroeconomic Resource and Emissions Model (MREM) reveal profound divergences in the future trajectory of Uzbekistan's economy depending on the selected policy track. The empirical findings demonstrate that far from acting as an economic dampener, the transition to a green economic model operates as a powerful structural accelerator that enhances long-term macroeconomic stability and significantly alters the nation's resource consumption dynamics.

Under the Business-As-Usual (BAU) scenario, while the nominal GDP continues an upward trajectory driven by population growth and basic capital accumulation, the economy encounters severe 'resource walls' and structural bottlenecks by 2030. The continued reliance on obsolete, thermal gas-fired power plants results in a projected 45% increase in total primary energy consumption, outstripping domestic natural gas production capacity and transforming Uzbekistan into a net importer of expensive fossil fuels. This structural shifts creates a persistent fiscal drag, expanding the current account deficit and depressing long-term GDP growth rates. Furthermore, under the BAU track, greenhouse gas emission intensity fails to decline, leading to a projected 52% expansion in absolute annual carbon dioxide equivalents (CO2e) emissions by 2035, leaving the nation exposed to severe international carbon border penalties and critical regional air quality degradation.

Conversely, the Moderate Green Transition (MGT) and Aggressive Decarbonization and Diversification (ADD) scenarios demonstrate clear patterns of absolute decoupling, wherein robust economic expansion is successfully achieved alongside a sharp, systemic contraction in environmental resource consumption and atmospheric emissions. In the ADD scenario, the aggressive deployment of capital toward solar, wind, and pumped-storage hydro infrastructure triggers an unprecedented structural transformation of the national energy grid. By 2030, the installed capacity of renewable energy reaches 15.6 Gigawatts (GW), effectively accounting for 42% of total national electricity generation. This massive displacement of fossil-fuel combustion allows for the preservation of domestic natural gas reserves, redirecting these valuable resources toward high-value downstream chemical synthesis and advanced industrial metallurgy, which yield significantly higher macroeconomic value per unit of resource than raw combustion.

To provide a clear, scannable macroeconomic comparative overview of the simulation outcomes at the key milestones of 2030 and 2035, the core structural indicators are synthesized in Table 1 below:

Table 1. Macroeconomic and Environmental Scenario Projections for Uzbekistan (2030–2035)

Macroeconomic & Environmental Indicator	BAU (2030 / 2035)	MGT (2030 / 2035)	ADD (2030 / 2035)
Real GDP Annual Growth Rate (%)	4.8% / 4.2%	5.6% / 5.9%	6.4% / 6.8%
Renewable Share in Power Grid (%)	8.2% / 9.0%	25.4% / 31.0%	42.1% / 55.4%

Total Primary Energy Demand (Mtoe)	52.4 / 58.1	44.2 / 41.5	38.6 / 34.2
GHG Emissions Intensity (kg CO2e/$ GDP)	1.12 / 1.08	0.78 / 0.61	0.45 / 0.28
Absolute Annual Emissions (Mt CO2e)	210.5 / 235.4	165.2 / 150.1	120.4 / 95.6
Net Cumulative 'Green Jobs' Created	Baseline / Negligible	+110,000 / +165,000	+285,000 / +380,000

The econometric outputs further illuminate a powerful structural rebalancing within the domestic labor market. While the aggressive decarbonization phase modeled in the ADD scenario inevitably induces structural contraction within legacy fossil-fuel extraction and low-efficiency heavy thermal processing sectors, this employment loss is overwhelmingly offset by the generation of high-skill 'green jobs'. The model estimates that the construction, operations, maintenance, and grid integration of renewable energy assets, combined with the domestic manufacturing of eco-efficient materials and advanced irrigation components, creates over 380,000 net positive, sustainable job opportunities by 2033. This labor shift significantly elevates the average technological complexity of the domestic workforce and drives wage growth in the engineering, high-tech manufacturing, and specialized agricultural management sectors.

In the agricultural sector—the cornerstone of rural livelihoods in Uzbekistan—the deployment of advanced automated drip irrigation and digital soil-moisture monitoring networks modeled in the ADD scenario yields critical dividends. The simulation indicates a 35% net reduction in absolute agricultural water consumption by 2032, while simultaneously increasing total crop yields by 22% due to optimized nutrient delivery and the mitigation of soil salinization. This successfully resolves the acute water-security dilemma that threatens to cripple the agricultural economy under the climate-stressed conditions inherent in the BAU track.

4. DISCUSSION

The empirical findings generated by this research clearly demonstrate that transitioning to a green economy is not a restrictive ecological constraint, but an indispensable precondition for the modern macroeconomic survival and long-term sovereignty of Uzbekistan. The stark divergence between the Business-As-Usual (BAU) path and the Aggressive Decarbonization and Diversification (ADD) model highlights that continuing along a carbon-intensive growth vector will inevitably plunge the nation into a structural trap characterized by systemic energy deficits, agricultural volatility, and diminished international trade relevance.

A central finding of the analysis is the mechanism of economic value creation via resource conservation. In the traditional economic framework, aggressive carbon mitigation is frequently viewed as a costly luxury that drains capital away from immediate industrial expansion. However, the unique structural characteristics of Uzbekistan's economy reverse this dynamic. Because the nation's electricity grid is historically dependent on natural gas, every megawatt-hour of electricity generated via solar or wind assets directly liberates a corresponding volume of gas from low-efficiency thermal combustion. This liberated gas can be rerouted into advanced domestic petrochemical clusters to manufacture high-value polymers, specialized composites, and advanced fertilizers, or exported to international markets at premium prices. This structural substitution effect fundamentally transforms renewable energy investment from an environmental expenditure into a highly lucrative asset that enhances the national trade balance and generates significant fiscal space.

Furthermore, the transition to a green economy directly addresses the impending challenges of the modern international trade regime. As global markets transition toward comprehensive carbon-accounting architectures, the carbon footprint of exported goods will increasingly determine their market access and pricing structures. Uzbekistan's current heavy industrial exports, such as steel, copper, chemicals, and textiles, possess an unsustainably high carbon intensity due to the thermal profile of the national grid. If the nation remains on the BAU trajectory, these vital export sectors will face catastrophic tariff penalties under mechanisms like the European Union's CBAM, effectively severing Uzbekistan from its most lucrative Western trading partners. Implementing the deep decarbonization protocols modeled in the ADD scenario is therefore essential to insulate the nation's export engine from international carbon border penalties and to position Uzbekistan as a premium supplier of low-carbon industrial components in the Eurasian landmass.

However, the operationalization of the ADD scenario presents profound institutional, financial, and structural challenges that cannot be ignored. The model presumes an unprecedented level of capital mobilization, requiring cumulative investments exceeding $28 billion over the next decade. Funding an infrastructure campaign of this magnitude is entirely beyond the independent capacity of the national state budget, necessitating a dramatic expansion of international green finance mechanisms. Uzbekistan must rapidly mature its domestic regulatory framework to attract private institutional capital, scaling up the issuance of sovereign and corporate 'Green Bonds', establishing clear legal definitions for green assets (Green Taxonomy), and streamlining Public-Private Partnership (PPP) protocols. Moreover, the massive influx of non-dispatchable solar and wind power into the national grid requires an immediate, parallel modernization of the transmission infrastructure, including the installation of utility-scale battery energy storage systems (BESS) and the deployment of digitalized 'Smart Grid' management algorithms to prevent catastrophic network instability.

From a socioeconomic perspective, the transition requires careful management to prevent regional disparities and structural unemployment. While the net job creation across the entire economy is strongly positive, the geographic distribution of these new opportunities may not automatically align with the areas experiencing job losses. Legacy fossil-fuel dependent regions, such as the industrial clusters in the Tashkent and Kashkadarya regions, will require targeted regional development programs, direct state-backed investment in alternative green industries, and comprehensive vocational retraining initiatives. Universities and technical institutes, particularly regional hubs like Namangan State Technical University, must stand at the absolute forefront of this transition, fundamentally redesigning their economic and engineering curricula to produce a new generation of specialists capable of managing advanced cyber-physical energy systems, carbon-accounting protocols, and eco-efficient industrial processes. Failure to synchronize educational outputs with the rapidly evolving demands of the green economy will result in critical human capital bottlenecks, stalling technological adoption and exacerbating localized structural unemployment.

5. CONCLUSION

This scientific article underscores that the transition to a green economy represents the defining structural pivot for the future of the Republic of Uzbekistan's economic development. Through the application of the Macroeconomic Resource and Emissions Model (MREM), the

study has empirically demonstrated that the historical, resource-intensive growth paradigm has exhausted its economic viability. Maintaining the status quo under a Business-As-Usual framework inevitably exposes the national economy to severe structural friction, including chronic energy insecurity, catastrophic water deficits in the agricultural core, and systemic vulnerability to international carbon adjustment penalties that threaten to isolate Uzbekistan from premium global markets.

The quantitative simulation of the Aggressive Decarbonization and Diversification (ADD) scenario offers a highly optimistic yet realistic alternative path forward. By aggressively reallocating capital toward renewable energy infrastructure, upgrading industrial manufacturing cores to state-of-the-art energy-efficiency standards, and deploying digitalized water-saving technologies across agricultural networks, Uzbekistan can successfully achieve a state of absolute decoupling. Under this transformative track, robust GDP growth is sustained alongside a projected 48% reduction in absolute greenhouse gas emissions by 2035, the preservation of strategic natural gas reserves for high-value chemical processing, and the creation of over 380,000 net new high-skill green jobs that will modernize the national labor force.

To operationalize this vital structural transformation and transition from theoretical scenarios to macroeconomic reality, the following strategic policy recommendations are proposed: 1. Rapid Expansion of Green Financial Architecture: Establish a comprehensive national Green Taxonomy aligned with international standards to eliminate risk and prevent greenwashing. Expand the issuance of specialized sovereign green bonds and introduce dedicated risk-guarantee frameworks to actively attract foreign direct investment into large-scale solar, wind, and energy storage projects. 2. Comprehensive Fiscal and Subsidy Reform: Implement a phased, highly transparent reduction of state subsidies for fossil fuels, allowing energy prices to accurately reflect their true economic and environmental costs. Simultaneously, channel a significant portion of the captured fiscal savings into a dedicated National Green Innovation Fund to provide subsidized low-interest credit for small and medium enterprises adopting certified energy-efficient technologies. 3. Implementation of a Localized Carbon Pricing Mechanism: Introduce a phased shadow carbon pricing protocol for state-owned enterprises and heavy industrial manufacturing sectors. This mechanism will incentivize corporate decision-makers to proactively embed carbon-mitigation metrics into their long-term capital procurement strategies, preparing the national industrial base for future integration into international emissions trading schemes. 4. Institutionalization of Grid Modernization Mandates: Legislate binding regulatory requirements for the mandatory installation of utility-scale battery storage assets alongside all new renewable energy installations. Direct public capital into the comprehensive expansion of high-voltage transmission lines to smoothly integrate remote geographic zones of high solar and wind potential into the main national industrial demand centers. 5. Systemic Revitalization of Human Capital and Academic Curricula: Formulate and fund a national 'Green Skills' educational directive. Provide substantial state grants to leading regional technical universities—such as Namangan State Technical University—to establish state-of-the-art research laboratories, design cutting-edge dual-degree programs in Renewable Energy Engineering and Green Macroeconomics, and launch large-scale professional retraining bootcamps for workers transitioning out of legacy industrial sectors.

In conclusion, the transition to a green economy is fundamentally a profound structural opportunity to reinvent the economic sovereignty of Uzbekistan. By boldly executing these synchronized institutional, financial, and educational reforms, the nation can transform its deep ecological vulnerabilities into a resilient engine of sustainable wealth creation, positioning itself as the undisputed vanguard of green economic modernization within the Central Asian region.

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ARTICLE INFORMATION IN OTHER LANGUAGES

Аннотация: В данной научной статье анализируются стратегическое значение, основные структурные механизмы и долгосрочные перспективы перехода к зеленой экономике в Республике Узбекистан. В условиях ускоряющейся глобальной климатической нестабильности и региональных экологических вызовов диверсификация экономической инфраструктуры путем отказа от интенсивного ресурсопотребления в пользу экологически чистых и энергоэффективных альтернатив стала национальным императивом. Используя многосекторную эконометрическую оценку тенденций и качественный сравнительный анализ, в исследовании рассматриваются основополагающие пути национальной зеленой модернизации. Ключевые области включают масштабирование интеграции возобновляемых источников энергии, снижение интенсивности выбросов парниковых газов на единицу ВВП, модернизацию транспортных систем и внедрение экоэффективных технологий в обрабатывающую промышленность. В статье анализируются три макроэкономических сценария: Бизнес как обычно (BAU), Умеренный зеленый переход (MGT) и Агрессивная декарбонизация и диверсификация (ADD). Результаты показывают, что проведение агрессивных зеленых реформ служит катализатором устойчивого экономического роста, повышает долгосрочную экспортную конкурентоспособность на международных рынках и создает новые рабочие места в сфере высоких технологий. В заключении представлен комплекс практических рекомендаций по ин-

теграции налоговых стимулов, специализированных институциональных структур и целевой профессиональной подготовки для полной реализации целей Стратегии перехода к зеленой экономике.

Ключевые слова: Зеленая экономика, Узбекистан, Устойчивое развитие, Возобновляемая энергия, Интенсивность ВВП, Экоэффективность, Диверсификация экономики, Макроэкономическое моделирование.