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PROMOTING GREEN ECONOMIC DEVELOPMENT IN VIETNAM: THE CASE OF HO CHI MINH CITY

Promovendo o Desenvolvimento Econômico Verde no Vietnã: o caso da cidade de Ho Chi Minh

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ABSTRACT
In the context of Vietnam's transition into a new development era that requires a shift toward a more sustainable growth model, green economic development has emerged as a strategic orientation at both national and local levels. As the largest economic center of the country and a key growth engine of the Southern Key Economic Region, Ho Chi Minh City has set the goal of becoming an "international megacity" based on the principles of smart, green, and innovative urban development. Within this process, the green economy is regarded as an appropriate development model that reconciles economic growth with environmental protection and the improvement of citizens' quality of life. Drawing on theoretical perspectives on sustainable development and the green economy, combined with an analysis of empirical evidence, this paper examines the current state of green economic development in Ho Chi Minh City in recent years. The study highlights major achievements while also identifying existing limitations and challenges in implementation. On this basis, the paper proposes several key solutions to promote green economic development, thereby contributing to the realization of Ho Chi Minh City's goal of becoming a smart, rapidly developing, and sustainable urban center in the coming period.
Keywords: Green Economic Development, Sustainable Development, Urban Sustainability, Ho Chi Minh City, Vietnam

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PROMOVENDO O DESENVOLVIMENTO ECONÔMICO VERDE NO VIETNÃ: O CASO DA CIDADE DE HO CHI MINH

Promoting Green Economic Development in Vietnam: the case of Ho Chi Minh city

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RESUMO
No contexto da transição do Vietnã para uma nova era de desenvolvimento que exige uma mudança para um modelo de crescimento mais sustentável, o desenvolvimento econômico verde emergiu como uma orientação estratégica tanto em nível nacional quanto local. Como o maior centro econômico do país e um importante motor de crescimento da Região Econômica Chave do Sul, a Cidade de Ho Chi Minh estabeleceu a meta de se tornar uma "megacidade internacional" com base nos princípios do desenvolvimento urbano inteligente, verde e inovador. Dentro desse processo, a economia verde é considerada um modelo de desenvolvimento apropriado que concilia o crescimento econômico com a proteção ambiental e a melhoria da qualidade de vida dos cidadãos. Com base em perspectivas teóricas sobre desenvolvimento sustentável e economia verde, combinadas com uma análise de evidências empíricas, este artigo examina o estado atual do desenvolvimento econômico verde na Cidade de Ho Chi Minh nos últimos anos. O estudo destaca as principais conquistas, ao mesmo tempo que identifica as limitações e os desafios existentes na implementação. Com base nisso, o artigo propõe várias soluções-chave para promover o desenvolvimento econômico verde, contribuindo assim para a realização da meta da Cidade de Ho Chi Minh de se tornar um centro urbano inteligente, de rápido desenvolvimento e sustentável no próximo período.
Palavras-chave: Desenvolvimento Econômico Verde, Desenvolvimento Sustentável, Sustentabilidade Urbana, cidade de Ho Chi Minh, Vietnã

INTRODUCTION

Ho Chi Minh City, a megacity and the largest industrial, service, financial, and seaport center in Vietnam, has been formed based on the integration of three leading and dynamic growth poles: the former Ho Chi Minh City, Binh Duong Province, and Ba Ria – Vung Tau Province. With a population exceeding 14 million, contributing approximately 25% of the national GDP and over 30% of total state budget revenues, the city plays a particularly significant role in Vietnam's economy. To further consolidate and enhance its position as the country's economic locomotive, while ensuring rapid and sustainable development "for the whole country and together with the whole country" and ultimately aiming at the well-being and happiness of the people, Ho Chi Minh City must adopt a development model that is appropriate to the requirements of the new context.

In the face of increasingly complex climate change, which directly affects coastal urban areas through sea-level rise, flooding, environmental degradation, and growing pollution, green economic development has become an inevitable trend. This approach is not only a solution for maintaining high economic growth rates, but also contributes to ensuring social progress and equity, improving environmental quality, and laying the foundation for comprehensive human development. Accordingly, Ho Chi Minh City is positioned not only as the nation's leading economic hub but also as a city striving to become livable, smart, and sustainable.

Against this backdrop, this paper focuses on analyzing the current state of green economic development in Ho Chi Minh City, clarifying the major achievements and existing limitations, and proposing several policy-oriented solutions to promote green economic development. These efforts aim to contribute to the realization of the goal of building Ho Chi Minh City into a smart, rapidly developing, and sustainable urban center in the coming period.

1 LITERATURE REVIEW

Green Finance and Green Economic Development

Green finance is widely recognized as a critical pillar in promoting green economic development amid the transition toward sustainable growth models. According to the World Bank's framework on inclusive green growth, green financial instruments play a pivotal role in directing capital flows toward environmentally friendly sectors while simultaneously supporting long-term economic growth and mitigating environmental and social risks (World Bank, 2012).

Empirical studies provide robust evidence of the positive impacts of green finance on sustainable development outcomes. Using China as a case study, Zhang and Wang (2021) demonstrate that green finance has a statistically significant positive effect on sustainable energy development and energy efficiency. Their findings suggest that green finance functions not merely as an environmental protection tool but also as a key driver of high-quality economic growth. Extending this line of inquiry, Huo et al. (2022) emphasize the importance of institutional frameworks and policy support in amplifying the effectiveness of green finance, particularly through positive spatial spillover effects in the context of digitalization and rapid urbanization.

Green Technology, Clean Energy, and Green Economic Growth

Alongside green finance, green technology, and clean energy are widely regarded as core drivers of green economic growth. The adoption of environmentally friendly technologies contributes not only to emission reductions and more efficient resource use but also to productivity enhancement and improved economic competitiveness.

In their study of G7 economies, Wani, Loganathan, and Hasaa (2024) find that green technology and renewable energy exert a positive influence on green economic growth, with foreign direct investment (FDI) and globalization serving as important mediating factors. These findings underscore the necessity of aligning green technological transformation with strategies to attract high-quality FDI and promote international economic integration. Such insights are particularly relevant for large cities in developing countries, where energy demand is rapidly increasing, and environmental pressures are intensifying.

Institutional Factors and Public Policy in Green Economic Development

A growing body of literature emphasizes that green economic development cannot be achieved solely through financial and technological solutions; instead, it is highly dependent on institutional quality and the effectiveness of public policies. The World Bank (2012) highlights institutions as a decisive factor in designing and implementing policies that balance economic growth, environmental protection, and social equity.

Through a global empirical analysis, Putri, Mushfiroh, and Hwihanus (2024) reveal a strong relationship between environmental fiscal expenditures, institutional quality, financial market development, and green economic growth. Their findings confirm that coherent, transparent, and long-term public policies are a prerequisite for achieving green growth objectives. In the Vietnamese context, Nga (2018) points out persistent shortcomings in environmental governance, noting that short-term economic priorities often overshadow long-term environmental considerations. This has intensified the contradiction between economic growth and environmental protection, underscoring the urgent need for institutional reform to support sustainable development.

Urban Context and Green Economic Development

The urban context, particularly that of large metropolitan areas, is increasingly regarded as the central arena for green economic development, given the concentration of population, economic activities, and environmental challenges. The study *The Pathway of Industrialization in the 21st Century: New Challenges and Emerging Models* (Oxford, 2021) stresses the necessity of shifting development models from resource-based economies toward knowledge-, science-, and technology-driven systems, with major cities serving as key engines of sustainable industrialization.

In Vietnam, empirical studies indicate a close linkage between rapid urban economic growth and mounting environmental pressures. Khuong (2015), in an analysis of Vietnam's northeastern mountainous provinces, highlights the environmental stresses arising from growth models heavily reliant on natural resource exploitation. Focusing specifically on Ho Chi Minh City, Trinh and Hieu (2021) argue that although the city has achieved economic growth rates exceeding the national average, this growth has been accompanied by increasing challenges such as social inequality and environmental pollution. These findings reinforce the necessity of transitioning toward a greener and more sustainable urban development model.

Overall, the thematic review indicates that green economic development is a multidimensional process shaped by the interaction of green finance, green technology, institutional factors, and the urban context. However, existing studies predominantly focus on developed countries or major economies such as China and the G7, while in-depth research on green economic development in large metropolitan areas within developing countries remains limited. In particular, systematic analyses of green economic development in Ho Chi Minh City, the largest economic hub in Vietnam, are still scarce. Addressing this gap, the present study aims to contribute both theoretical insights and practical policy implications for promoting green economic development in Ho Chi Minh City in the context of contemporary urban transformation.

2 THEORETICAL FRAMEWORK

Green economy theory shares many similarities with the historical materialist perspective on the dialectical relationship between human beings and nature. From this viewpoint, nature constitutes the "inorganic body" of human beings. Through practical activity, humanity has progressed from a stage of living directly off natural products to actively transforming nature to create material wealth that satisfies the requirements of existence and development, since "the first premise of all human history is, of course, the existence of living human individuals… men must be in a position to live to be able to "make history", but life involves before everything else eating and drinking, a habitation, clothing, and many other things" (Marx & Engels, 1995, p. 654).

In the course of production and economic development, human societies have increasingly exploited natural resources on both scale and intensity. This process has enabled remarkable achievements, propelling humanity into the era of the knowledge economy and post-industrial civilization. However, these accomplishments have been accompanied by multidimensional crises, including economic and financial crises, ecological degradation, climate change, and food insecurity. Such realities remind us of Engels's warning that "we should not flatter ourselves

overmuch on account of our human victories over nature. For each such victory nature takes its revenge on us" (Marx & Engels, 2002, p.166).

Today, humanity is compelled to search for a more appropriate model of economic development, one that is more harmonious with nature. Such a model must simultaneously ensure economic growth, maintain environmental quality, reduce ecological imbalance and climate risks, promote the sustainable use of natural resources, and avoid exacerbating social inequality, thereby creating conditions for sustainable development. The economic model that best meets these requirements is the green economy.

With the objective of building "an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2011), the United Nations Environment Programme initiated the concept of the green economy. The World Bank defines the green economy as "an economy in which economic growth and improvements in human well-being are driven by sustainable economic activities that protect the environment" (World Bank, 2012). Green economic development also entails restructuring the economy toward a long-term growth pathway based on renewable energy and innovation, which serves as a driving force for transforming the growth model, creating green jobs, and enhancing national competitiveness in the long run, while also providing effective responses to climate change (OECD, 2020).

These perspectives converge in viewing the green economy as a balanced integration of economic, environmental, and social dimensions, aiming to achieve economic growth, generate employment, protect the environment, and respond effectively to climate change in pursuit of sustainable development. Consequently, the green economy has become a strategic choice for countries and territories seeking to ensure long-term economic growth in parallel with environmental protection and social equity. In this regard, Vietnam, guided by the consistent principle of "not sacrificing social progress, social equity, and the environment for the sake of purely economic growth," is making determined efforts to transition toward green economic development.

3 RESEARCH METHODS

This study is grounded in the methodological framework of Marxism, adhering to fundamental principles such as objectivity, comprehensiveness, development, and the historical concrete approach. These principles ensure a scientific, dialectical, and practice-oriented perspective in addressing the research problem. On this basis, the paper employs a combination of specific research methods, including analysis and synthesis to clarify both theoretical and practical issues; comparison and contrast to identify similarities and differences among various approaches and models of green economic development; and the historical method in conjunction with logical analysis to explain the formation, evolution, and development of the green economy in the context of Ho Chi Minh City.

In addition, an interdisciplinary research approach is adopted to integrate perspectives from economics, environmental science, social sciences, and urban development management, thereby capturing the complex and multidimensional nature of green economic development in a megacity. Finally, the methods of systematization and philosophical generalization are applied to derive fundamental and orienting insights, which provide a solid theoretical and practical foundation for proposing solutions to promote green economic development in Ho Chi Minh City.

4 RESULTS

Achievements

Ho Chi Minh City has long been one of the country's leading centers of economic, cultural, and scientific and technological development. Following 1 July 2025, the city has acquired additional potential to emerge as a new megacity through the merger of three major economic growth poles: Ho Chi Minh City, Binh Duong, and Ba Ria - Vung Tau. With a population exceeding 14 million, contributing nearly 25% of the national GDP and more than 30% of total state budget revenues, the newly established Ho Chi Minh City is founded on the inheritance and

consolidation of the achievements and comparative advantages of the three localities. This integration generates significant synergistic effects by effectively leveraging the distinct strengths of each area, thereby creating a solid foundation for the successful implementation of future development strategies, including the green economic development strategy, while contributing to the realization of Vietnam's commitment to achieving net-zero emissions by 2050, as announced at COP26.

First, the legal, strategic, and planning framework guiding green economic development in the city has been increasingly consolidated and refined. Green economic development is recognized as a strategic transformation aimed at shaping a new growth trajectory toward green growth and long-term sustainability. In this process, the leadership and orientation provided by the Party Committee, municipal authorities, and state management agencies play a decisive role, reflected in the formulation and coordinated implementation of policies, strategies, and action plans. These instruments guide enterprises and citizens toward greener patterns of production and consumption. The Socio-Economic Development Strategy of Ho Chi Minh City for the 2011–2020 period emphasized the need for "harmonious development between economic growth, culture, and social progress, alongside environmental protection and climate change adaptation" (Ho Chi Minh City Party Committee, 2020, p.163). Building on this foundation, the municipal government approved the Environmental Pollution Reduction Program for 2020–2030 and the action plan for implementing the National Green Growth Strategy toward sustainable development in the city for the 2021–2030 period. Currently, Ho Chi Minh City is shaping a green development strategy toward 2030, with a vision to 2050, which places people at the center as subjects, objectives, drivers, and resources of development while focusing on four key pillars: green human resources development, green infrastructure development, promotion of green behaviors, and the identification of pioneering sectors, combined with strengthened regional linkages and international cooperation.

The green economic development of Ho Chi Minh City has been further reinforced by the National Assembly's adoption of Resolution No. 98 on piloting specific mechanisms and policies for the city's development. This resolution expands decentralization and delegation of authority, granting the city greater autonomy in mobilizing and utilizing available resources. Notably, it removes certain constraints in budget management and use; allows pilot implementation of transit-oriented development (TOD) models; allocates public investment capital to support poverty reduction and employment generation; and introduces financial mechanisms for greenhouse gas emission reduction through carbon credit trading and offset schemes. Revenues generated from carbon credit transactions are retained entirely in the city's budget, thereby enhancing financial resources for climate change adaptation, green economy, digital economy, and circular economy initiatives. In addition, the city is authorized to adopt incentive mechanisms encouraging individuals, households, cooperatives, and enterprises to use clean energy, reduce environmental pollution, and improve urban and environmental resource management. Resolution No. 98 has thus played a dual role: addressing longstanding institutional bottlenecks while catalyzing the unlocking of the city's development potential and comparative advantages.

The first Party Congress of Ho Chi Minh City after the merger, held from 13 to 15 October 2025, marked a significant milestone in the city's development trajectory, as most key socio-economic indicators were achieved. In 2025, the city's gross regional domestic product (GRDP) was estimated at approximately VND 3.03 quadrillion, accounting for 23.5% of national GDP, while GRDP per capita reached an estimated VND 220 million, about 1.7 times the national average (Anh, 2025). Building upon the achievements of Binh Duong's smart city model, recognized by the Intelligent Community Forum in 2023 as a "pioneering bright spot" (Khanh, 2025), the development model of "three regions, one special zone, three corridors, and five pillars" has been identified as an appropriate approach. By consistently placing people at the center of all policies and initiatives, this model is expected to generate strong synergies in development potential, expand growth space, and create new development momentum for Ho Chi Minh City.

Furthermore, since 2018, the city's authorities have persistently developed and elevated the annual policy dialogue mechanism through the Ho Chi Minh City Economic Forum (HEF). The forum serves as a platform bringing together committed and capable experts, scholars, policymakers, and business leaders to contribute ideas, share experiences, and propose solutions for the development of both Ho Chi Minh City and the country as a whole. Each year's forum theme closely aligns with emerging global and regional trends, ranging from digital economy (2022) and green growth (2023) to sustainable industrial transformation (2024). In 2025, the forum was upgraded to the Autumn Economic Forum under the theme "Green Transformation in the Digital Era," reflecting the city's determination, following the merger, to continue leading in green transformation, smart urban development, high-tech investment attraction, and the gradual formation of an international financial center. In the context of green and digital transformation, which is no longer an optional trend but a mandatory requirement of the times, they have become the main driving force to ensure competitiveness, energy security, environmental security, and improve the quality of life for the people.

Second, the City has maintained a high rate of economic growth, with an increasingly modern economic structure, green transformation in industrial zones, and the sustainable development of green tourism. Ho Chi Minh City has consistently maintained a relatively high economic growth rate. During the period 2011–2015, the average growth rate reached 7.2%; in 2016 – 2020, it stood at 6.41%. Although economic growth turned negative in 2021 due to external shocks, the economy recovered strongly thereafter and continued to outperform the national average, with growth rates of 9.03% in 2022 and 5.81% in 2023. In 2022, the city's GRDP at current prices reached VND 1,479,227 trillion, equivalent to USD 63.6 billion, while GRDP per capita amounted to VND 157.9 million, or USD 6,786 (Ho Chi Minh City Statistics Office, 2023). In 2024, GRDP growth reached 7.17%, accompanied by a sustained shift toward a modern economic structure: the service sector accounted for 65.5% of GRDP, industry and construction for 21.7%, agriculture, forestry, and fisheries for only 0.5%, and taxes on products, less subsidies accounted for 12.3% (Xuan & Hua, 2025). In 2025, GRDP was estimated to increase by 8.03%, reaching nearly VND 3 quadrillion (accounting for 23.5% of national GDP), while GRDP per capita rose to USD 8,755 (Vuong, 2025). This sustained high growth and modern structural transformation provide a solid material foundation for the development of a green economy in the city.

Green transformation has been strongly promoted in the tourism sector. Following administrative integration, Ho Chi Minh City has gained additional potential for sustainable tourism development, including unique ecotourism in the Can Gio Mangrove Biosphere Reserve, the Rung Sac historical site, and the Con Dao special zone, which possesses significant advantages in cultural, historical, and marine ecotourism. According to the Ho Chi Minh City Department of Tourism, the total number of international visitors reached an estimated 7.37 million, while domestic visitors totaled nearly 37.3 million in the first 11 months of 2025, generating revenues of approximately VND 234 trillion (Le, 2025). These conditions enable the city to position tourism as a spearhead green economic sector, diversify tourism products, attract visitors, and enhance its image as a modern, friendly, and livable city.

Green transformation has also been vigorously implemented in the Cat Lai port cluster and the Cai Mep port complex, to become pioneering "green ports" in Vietnam. Initiatives include the installation of over 400,000 m² of rooftop solar panels (with a total capacity of approximately 80 MW per year), the deployment of internal electric buses, the replacement of two-stroke diesel engines with four-stroke engines in service vessels, pilot implementation of semi-automated port operations at Cat Lai, and the development of electric barges and green transport corridors. These measures have contributed to reducing CO_2 emissions, saving fuel, and generating estimated cost savings of USD 1.5–2 million annually (Lu, 2025). In addition, the city has accelerated green transformation in urban transportation, increasing the share of electric vehicles: electric taxis account for approximately 71%, while electric buses represent 26.3% of the fleet, with 627 vehicles in operation (Quang, 2025). These efforts have helped reduce emissions, noise pollution, and air pollution.

Third, the City's development space has been expanded toward a green urban model associated with socio-cultural values, climate change adaptation, and improved quality of life. One of the key indicators of a modern city oriented toward climate resilience, pollution reduction, and enhanced quality of life is green infrastructure. To develop into a "megacity," Ho Chi Minh City has decided to convert prime land plots into parks, squares, and green public spaces integrated with transport infrastructure and socio-cultural values. Notable examples include the conversion of the site at No. 1 Ly Thai To Street (Vuon Lai Ward) and the Nha Rong – Khanh Hoi Port area (Xom Chieu Ward) into public parks, incorporating a memorial dedicated to citizens, officials, and soldiers who died during the COVID-19 pandemic. The transformation of the Nha Rong–Khanh Hoi Port area into a park and public square directly connected to the Ho Chi Minh Museum allocates nearly 60% of the area to green spaces and water surfaces, 20% to public facilities, and 20% to international port activities. This transformation not only facilitates the development of the Ho Chi Minh Cultural Space along the Saigon River of great socio-cultural significance but also alleviates traffic bottlenecks, addresses environmental challenges, and reshapes the urban landscape of the city center.

Similarly, coastal land along Thuy Van Road at Bai Sau Beach (Vung Tau Ward) has been designated for the expansion of coastal parks and pedestrian promenades, creating a large public beach park that elevates the urban profile of Vung Tau and supports its transformation into a high-quality tourism center. In Binh Duong, industrial urban areas are being developed toward a green and sustainable model, with the establishment of green belts and expanded green coverage to mitigate PM2.5 dust, improve environmental quality, and enhance investment attractiveness. Beyond spatial restructuring and environmental improvement, these long-term transformations are expected to shape a modern, humane, green urban identity and significantly enhance residents' quality of life.

Fourth, environmental protection activities have achieved tangible results, leading to marked improvements in living conditions. Before administrative integration, Binh Duong, despite being one of the country's leading industrial hubs, had established a comprehensive automatic wastewater monitoring system across its industrial zones and achieved the highest rate of municipal solid waste collection and treatment, primarily through waste-to-energy incineration rather than landfilling. The province ranked among the top five localities nationwide in terms of green environmental indices. In Ba Ria–Vung Tau, environmental protection efforts were also implemented relatively effectively. In the former Ho Chi Minh City, the municipal government made substantial efforts to balance the budget and mobilize resources for environmental investment projects.

To rehabilitate heavily polluted canals, the city invested approximately VND 9 trillion in the Tham Luong - Ben Cat - Nuoc Len Canal renovation project, with completion targeted for 2026; over VND 17 trillion for dredging, environmental rehabilitation, and infrastructure development along the Xuyen Tam Canal; more than VND 7.434 trillion for the dredging and urban upgrading of the Ong Be drainage canal; and over VND 9.228 trillion for similar works along the Ba Lon Canal (Nguyen, 2025). These projects have contributed to the development of modern and synchronized canal-side infrastructure, environmental improvement, and enhanced living conditions for thousands of households. In addition, the city is implementing other projects, such as erosion control on the Thanh Da Peninsula and drainage system upgrades along Tran Xuan Soan Street, with the expectation that flooding caused by heavy rainfall and tidal surges will be effectively mitigated.

Municipal solid waste management has also undergone positive changes, with a gradual reduction in landfilling. Currently, approximately 40% of household solid waste in Ho Chi Minh City is treated through incineration, composting, and recycling technologies, while about 60% is disposed of in sanitary landfills. According to the Resolution of the 11th Ho Chi Minh City Party Congress (2025–2030), the proportion of municipal solid waste recycled or treated using advanced technologies is targeted to exceed 90% (Quoc, 2025). The city is accelerating investment in advanced waste treatment plants. Moreover, the campaign "Ho Chi Minh City residents do not litter streets and canals, for a clean city and reduced flooding" has yielded positive results,

raising public awareness of environmental protection and public hygiene. Numerous meaningful environmental initiatives have been launched, mobilizing broad public participation and fostering green consumption habits.

These achievements confirm that green economic development in Ho Chi Minh City is progressing in the right direction, reinforcing its role as the nation's leading economic engine and aligning with global trends toward sustainable development.

Limitations

Institutional and policy-related constraints. In terms of institutions and policies, the strategic framework for green economic development in Ho Chi Minh City has been shaped across different stages through various sectoral programs. However, significant difficulties and inconsistencies have emerged during implementation. Although the National Assembly has granted the city specific institutional mechanisms, their practical application has revealed numerous bottlenecks. Despite being "new," these mechanisms have proved relatively restrictive compared to the requirements for creating strong momentum toward a green growth model and sustainable development, particularly after the expansion of the city's administrative boundaries.

The implementation of a two-tier local government system has also generated confusion and operational difficulties for public authorities, citizens, and businesses alike, requiring time for institutional adjustment. Objectively, this transition may exert unintended negative impacts on green economic development. Moreover, the newly expanded Ho Chi Minh City needs time to comprehensively review, assess, formulate, and adjust unified strategies, programs, plans, and spatial planning across the new administrative area, while simultaneously developing green development models tailored to the specific conditions of the former localities, such as a blue-green marine economy for Con Dao and Can Gio.

In addition, regulatory frameworks for eco-industrial parks, high-tech zones, green factory standards, and indicator systems to assess the "greenness" of different sectors have not yet been fully established. These are essential prerequisites for evaluating and operationalizing national and local green development strategies. As a result, many projects have encountered procedural obstacles and delays without effective resolution mechanisms due to unclear regulations, leading to substantial resource wastage and socio-economic and environmental losses that are difficult to quantify. A notable example is the flood control project with an investment of over VND 10 trillion under a BT (Build–Transfer) arrangement, which had completed more than 90% of construction but has been suspended since November 2020 due to difficulties in capital allocation and legal procedures. Collectively, these issues constitute significant institutional barriers to the city's green economic development efforts.

Urban infrastructure challenges. Green economic development in Ho Chi Minh City requires a foundation of smart and green urban infrastructure with strong resilience to systemic risks and crises. In practice, the city faces major challenges in developing green public transportation, as only one metro line has been put into operation, while others remain under construction. Road traffic infrastructure is severely overloaded, with congestion becoming a persistent characteristic of the former Ho Chi Minh City. Air pollution caused by vehicle emissions has intensified, seriously affecting production activities and public health.

Notably, the transport sector alone emits more than 13 million tons of CO_2 annually, making it the second-largest source of emissions after industry. Total greenhouse gas emissions in the city are estimated at approximately 60 million tons of CO_2 per year, accounting for 23% of national emissions (Uyen, 2025). Although green spaces, parks, and urban tree systems have received increasing attention, they remain insufficient to meet the standards of a green city. Without effective and timely solutions to these infrastructure challenges, Ho Chi Minh City will find it difficult to achieve its ambition of becoming a livable green city.

Investment capital and technological constraints. Developing into a green city and successfully implementing green and digital transformation will require Ho Chi Minh City to mobilize approximately VND 900 trillion (equivalent to USD 34 billion) over the next decade, around USD 4 billion annually (Thai & Le, 2025). A

critical question remains unresolved: how can such a massive volume of capital be mobilized sustainably and efficiently?

In reality, many enterprises, particularly small and medium-sized enterprises (SMEs), face serious constraints in terms of capital and technology. As a result, up to 90% of businesses are not yet ready for green transformation (Phuong & Bich, 2025). Technological applications in environmental protection remain limited, especially in environmental monitoring, solid waste collection and treatment, and wastewater management. Without technological upgrading, it will be difficult to meet environmental standards and establish a solid foundation for sustainable development.

Human resource challenges. The most fundamental factor for green economic development is the availability of green human resources equipped with green skills, digital competencies, innovation capacity, adaptive thinking, and strong environmental awareness in the labor process. Although Ho Chi Minh City attracts a large labor force, a structural imbalance persists: while low-skilled labor is abundant, there is a shortage of highly qualified professionals, particularly in fields such as artificial intelligence and data science, automation, renewable energy, logistics and financial management, environmental technology, organic agriculture, and waste management.

Forecasts indicate that during the 2025 – 2030 period, Ho Chi Minh City will require between 800,000 and over one million new workers, with approximately 70% concentrated in high-tech service and industrial sectors (Phan, 2025). Many enterprises aspire to adopt advanced technologies but are constrained by the lack of adequately skilled human resources.

These limitations and challenges indicate that, despite significant achievements in green economic development, Ho Chi Minh City continues to face substantial structural and institutional obstacles. Addressing these issues through further research, policy adjustment, institutional reform, and capacity building will be essential for the successful development of a green economy in the new development era.

5 **DISCUSSION**

The limitations and challenges outlined above demonstrate that green economic development in Ho Chi Minh City is not merely a technical or sectoral issue, but a complex and systemic process involving institutions, infrastructure, finance, technology, and human resources. If these constraints are not addressed in a timely and coordinated manner, they may weaken the city's capacity to sustain green growth and to realize its ambition of becoming a smart, livable, and sustainable megacity. Accordingly, addressing these challenges requires a comprehensive and integrated set of solutions, grounded in both theoretical and practical foundations, while remaining consistent with the specific conditions of Ho Chi Minh City. On this basis, the following section proposes policy implications and strategic solutions aimed at promoting green economic development and enhancing the city's long-term sustainability.

First, as the newly established city is formed through the merger of three localities, it is necessary to develop a unified green economic development strategy based on a thorough review, supplementation, and refinement of the existing strategies of each former locality. This approach aims to maximize the combined advantages of the three sub-regions, which are characterized by the coexistence of a large metropolitan area, a deep-sea port system, and zones of agriculture and coastal forests. Harnessing the overall strength of the new city requires close integration from strategic formulation and spatial planning to resource mobilization and coordinated implementation, ensuring effectiveness, practicality, and alignment with shared development goals, with people placed at the center. At the same time, the two-tier urban governance structure should be rapidly consolidated and streamlined toward a more flexible and transparent model, including the implementation of a "green one-stop shop" mechanism to shorten administrative procedures and project timelines, particularly for high-technology and environmental protection projects. To enable policymakers, enterprises, and investors to gain a comprehensive

view of the green economic ecosystem, the city should promptly establish an integrated master planning map for the entire Ho Chi Minh City region, structured around key pillars such as renewable energy, green logistics, seaports, water and waste treatment infrastructure, green industrial parks, and eco-industrial zones. On this basis, long-term strategies and action plans can be developed, clearly defining the roles and responsibilities of relevant stakeholders.

Second, to build a low-emission, resource-efficient, and environmentally friendly economy, the city should proactively pilot innovative regulatory mechanisms, notably sandbox frameworks for new products, services, and business models. Such mechanisms can stimulate innovation, particularly in emerging technological fields, by allowing enterprises to test novel ideas in contexts where existing legal frameworks have yet to adapt to new forms of economic activity. Given its historical role as a "policy laboratory," especially in economic reform, Ho Chi Minh City has often served as a pioneer of national innovation; therefore, the bold experimentation with new regulatory arrangements in the current period is both feasible and necessary. This approach would facilitate the mobilization of diverse resources and the development of varied models to ensure that green and digital transitions are implemented effectively and sustainably. Successful pilot initiatives can subsequently be scaled up within a reliable legal framework, while unsuccessful experiments still generate valuable lessons and practical experience for both enterprises and policymakers to further refine regulations.

Third, the city should intensify investment promotion efforts to attract resources into sectors with high value added, strong knowledge intensity, low labor dependence, and the application of advanced, new, and high technologies. In the current context, particular attention should be paid to selectively attracting foreign direct investment (FDI) projects that employ high-tech, clean, and environmentally friendly technologies, thereby fostering green investment. At the same time, research and development in new materials and new energy sources should be strengthened, alongside the provision of comprehensive financial, fiscal, and institutional incentives to encourage enterprises to undertake green transformation. Investment in the completion of green infrastructure systems, from transportation and urban management to support services that assist enterprises and citizens in adopting cleaner technologies, should be regarded as a strategic priority. In the long term, development thinking needs to shift toward encouraging enterprises to invest in innovation and enhance their capacity to absorb and master technologies, particularly core and source technologies, thereby fostering a harmonious integration of technology, human capital, and nature to generate sustainable value.

Fourth, continued efforts are required to improve and enhance the quality of education and training systems, accompanied by increased investment in human resources for key technological sectors, while avoiding the dispersion of resources. Policies promoting close cooperation among the state, educational institutions, and enterprises should be further strengthened, encouraging enterprises to engage more deeply in training processes and in the provision of high-quality green human resources. Skilled experts, engineers, and workers within enterprises can contribute to practical teaching, while lecturers and students are given greater opportunities to engage directly with production realities. This integrated approach can effectively address the mismatch between labor supply and demand, both shortages and surpluses that often emerge during the transition toward a green economy.

CONCLUSION

Ho Chi Minh City is entering a new stage of national development with its position as one of Vietnam's leading centers of economy, culture, education, and science and technology, while simultaneously facing increasingly severe impacts of climate change, sea-level rise, and environmental pollution. In this context, the city has been making concerted efforts to promote a green economic model in order to sustain high economic growth while meeting the requirements of environmental and social sustainability. By mobilizing diverse resources and

harnessing its innovation potential, Ho Chi Minh City has achieved several initial outcomes in green economic development. However, this process continues to encounter significant barriers, including institutional and policy shortcomings, constraints in financial resources and human capital quality, fragmented urban infrastructure, and deficiencies in spatial development planning.

These realities underscore the urgent need for the city to proactively seize emerging opportunities, accelerate the consolidation of the two-tier urban governance model, capitalize on existing advantages, and boldly implement breakthrough mechanisms and policies to more effectively attract financial resources and high-quality human capital. At the same time, greater emphasis should be placed on developing a green urban system with a polycentric structure, advancing education and training aligned with the formation of a green workforce, and strengthening communication and public awareness to foster broad societal engagement. The coordinated implementation of these measures will not only establish a solid foundation for the city's green economic development in the coming period but also contribute to realizing the vision of Ho Chi Minh City as a livable, civilized, and modern metropolis, as well as a regional hub of innovation and international integration.

REFERENCES

Anh, T. (2024, January 26). Ho Chi Minh City: A "long journey" of efforts toward green transition. *Government Electronic Newspaper*. https://tphcm.chinhphu.vn/tphcm-hanh-trinh-van-dam-no-luc-chuyen-doi-xanh-101240126132312418.htm

Communist Party Committee of Ho Chi Minh City. (2020). Documents of the 11th Congress of the Ho Chi Minh City Party Committee, 2020–2025. Ho Chi Minh City.

Communist Party Committee of Ho Chi Minh City. (2025). Documents of the 12th Congress of the Ho Chi Minh City Party Committee, 2025–2030. Ho Chi Minh City.

General Statistics Office of Ho Chi Minh City. (2023). Ho Chi Minh City statistical yearbook 2022. Statistical Publishing House.

Huo, D., Zhang, X., Meng, S., Wu, G., Li, J., & Di, R. (2022). Green finance and energy efficiency: Dynamic study of the spatial externality of institutional support in a digital economy by using a hidden Markov chain. *Energy Economics*, 116, 106431.

HTV News. (2025, July 30). *Roadmap for green transformation of industrial zones in Ho Chi Minh City*. https://www.youtube.com/watch?v=C5ZvQGWeK9Q

Khanh, L. (2025, December 4). *Ho Chi Minh City in a "dual race":* Inheriting Binh Duong to shape a digital and green future. VietnamPlus. https://www.vietnamplus.vn/thanh-pho-ho-chi-minh-tren-duong-dua-kep-ke-thua-binh-duong-de-kien-tao-tuong-lai-so-va-xanh-post1081054.vnp

Khuong, N.T. (2015). *The relationship between economic development and natural environment protection in the mountainous provinces of Northeast Vietnam.* Thai Nguyen University Publishing House.

Le, A. (2025, April 12). Ho Chi Minh City's tourism sector records positive signals. *Government Electronic Newspaper*. https://tphcm.chinhphu.vn/nganh-du-lich-thanh-pho-ghi-nhan-tin-hieu-tich-cuc-101251204084517642.htm

Lindenberg, N. (2014). *Definition of Green Finance, German Development Institute*. https://www.die-gdi.de/uploads/media/Lindenberg_Definition_green_finance.pdf

Marx, K., & Engels, F. (1995). Collected works (Vol. 20). Hanoi: National Political Publishing House.

Marx, K., & Engels, F. (2002). Collected works (Vol. 19). Hanoi: National Political Publishing House.

Nga, N.T. (2018). *The issue of natural environment protection in the process of industrialization and modernization in Vietnam today.* Hanoi: National Political Publishing House.

Nguyen, C. (2025, December 7). A series of projects is expected to address flooding in Ho Chi Minh City. *Lao Dong Newspaper*. https://laodong.vn/xa-hoi/loat-du-an-ky-vong-giai-quyet-tinh-trang-ngap-nuoc-o-tphcm-1621415.ldo

OECD. (2020). *Green growth and sustainable development*. https://www.oecd.org/greengrowth/

Oxford. (2021). *The path of industrialization in the 21st century*: New challenges and outstanding models. Hanoi: National Political Publishing House.

Phan, D. (2025, November 9). *Ho Chi Minh City needs more than one million new workers by 2030*. https://thanhnien.vn/tphcm-can-hon-1-trieu-lao-dong-moi-tu-nay-den-2030
Phuong, U., & Bich, L. (2025, October 2). *Ho Chi Minh City sets targets for greening production*. https://tienphong.vn/tphcm-dat-muc-tieu-xanh-hoa-san-xuat-post1783294.tpo
Putri, I. A., Mushfiroh, L., & Hwihanus, H. (2024). Green Economic Growth: A Global Analysis of Fiscal Expenditures, Institutional Quality, and Stock Markets. *Journal of Environmental Economics and Sustainability*, 1(3), 1–11. https://doi.org/10.47134/jees.v1i3.345
Quang, Q. (2025, October 30). *Ho Chi Minh City promotes green transportation to reduce environmental pollution*. https://nhandan.vn/thanh-pho-ho-chi-minh-day-manh-giao-thong-xanh-giam-o-nhiem-moi-truong-post919099.html
Quoc, A. (2025, November 5). *Ho Chi Minh City:* Urgent need to reduce methane emissions. https://nld.com.vn/tp-hcm-cap-thiet-giam-phat-thai-khi-me-tan-196251105144726863.htm
Trinh, N.V., & Hieu, L.T.H. (2021). Transforming the growth model of Ho Chi Minh City to 2020 and orientation to 2030: Short-term, medium-term, and long-term solutions. *Human Resource Development Journal*, (6), 37.
UNEP. (2011). *Towards a green economy:* Pathways to sustainable development and poverty eradication. United Nations Environment Programme.
Uyen P. (2025, September 25). *Green economy* – The inevitable direction of Ho Chi Minh City's "megacity". https://tienphong.vn/kinh-te-xanh-huong-di-tat-yeu-cua-dai-do-thi-tphcm-post1781155.tpo
Vuong, L. (2025, December 10). Ho Chi Minh City is ready to serve as a policy laboratory, especially in economic development. *Nhan Dan Newspaper.* https://nhandan.vn/thanh-pho-ho-chi-minh-san-sang-la-phong-thi-nghiem-chinh-sach-nhat-la-ve-kinh-te-post929277.html
Wani M. J. G., Loganathan, N., & Hasaa, E. H. A. (2024). Impact of green technology and energy on green economic growth: role of FDI and globalization in G7 economies. *Future Business Journal*, 10, Article 43. https://doi.org/10.1186/s43093-024-00329-1
World Bank. (2012). *Inclusive green growth:* The pathway to sustainable development. World Bank.
Xuan, A., & Hua, C. (2025, January 30). *Ho Chi Minh City awaits the "sweet fruits" of economic growth*. https://www.vietnamplus.vn/thanh-pho-ho-chi-minh-cho-ngay-hai-qua-ngot-tang-truong-kinh-te-post1009831.vnp truy cập ngày 10/12/2025