

# Insights from Singapore's Green Economy for the High-Quality Development of Shanghai's Green Economy

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## Abstract

This paper conducts a comprehensive analysis of the strategic background, key components, and outcomes of Singapore's green economy. It further explores the implications of Singapore's green economy for the high-quality development of Shanghai's green economy in light of the latter's specific context. Singapore has achieved significant growth in its green economy through pivotal elements such as robust government initiatives, support for technological innovation, the development of green industries, and international collaboration and exchange. Although Shanghai has made positive strides in transitioning to a green economy, it continues to face numerous challenges. This paper suggests that Shanghai should draw on Singapore's experiences by formulating long-term strategies, enhancing technological innovation, increasing public participation, and deepening international cooperation to promote the high-quality development of its green economy.

## Keywords

Singapore's Green Economy, Shanghai's Green Economy, High-Quality Development, Strategic Planning

## 1. Introduction

In the context of increasingly severe global climate change and environmental pollution, the green economy has emerged as a crucial pathway for promoting sustainable economic development. Singapore, as a resource-scarce island nation, has successfully transformed into a globally recognized "Garden City" by implementing a series of innovative green economic development strategies. This transformation has not only enhanced the quality of the ecological environment but

also facilitated sustained economic growth. Singapore's model of green economic development provides valuable experiences and insights for other cities (Quah & Tan, 2022).

As the economic center and international metropolis of China, Shanghai has made positive strides in its transition to a green economy in recent years; however, it still faces numerous challenges. Achieving high-quality development within its green economy has become a pressing issue that Shanghai must address. The experiences of Singapore's green economy undoubtedly offer important references and lessons for Shanghai. This paper aims to conduct an in-depth analysis of the strategic background, key components, and outcomes of Singapore's green economy, while also examining the implications of these findings for the high-quality development of Shanghai's green economy. The goal is to provide valuable insights and recommendations for Shanghai's transition toward a green economy.

## **2. Overview of Singapore's Green Economy Development**

### **2.1. Strategic Background and Objectives of Singapore's Green Economy**

As a city-state with limited land area and scarce natural resources, Singapore has recognized the close relationship between environmental protection and economic development since its independence. Confronted with limited land, water shortages, and increasing environmental pressures, the Singaporean government began to actively explore pathways for developing a green economy, aiming to achieve sustainable economic growth through green transformation.

The strategic background of Singapore's green economy can be traced back to the 1970s when the country was undergoing a transition from a manufacturing-based economy to a service-oriented economy. The government recognized that sustaining economic growth necessitated addressing environmental issues simultaneously, leading to the implementation of a series of greening policies, such as afforestation and urban greening. In the 21st century, as global attention to climate change and environmental protection intensified, the Singaporean government further clarified its objectives for green economic development. The goal was to achieve low-carbon, circular, and ecological economic growth through technological innovation and the cultivation of green industries, thereby constructing a livable and sustainable urban environment.

The objectives of Singapore's green economy extend beyond merely addressing current environmental challenges; they also aim to establish a solid foundation for sustainable development in the future. The government has articulated a vision of achieving "A City in Nature" by 2030, reflecting Singapore's high regard for green ecology and its determination to promote the high-quality development of the green economy. To realize this vision, the Singaporean government has developed a series of specific policy measures, such as promoting green buildings, developing green transportation, and encouraging the use of clean energy, striving for green transformation across various sectors (Chng & Ong, 2021).

## 2.2. Status of Singapore's Green Economy

Since gaining independence in 1965, Singapore has experienced rapid economic development. In 2021, Singapore's GDP per capita was approximately 97,798 Singapore dollars (around 72,599 US dollars), ranking second globally in terms of GDP per capita adjusted for purchasing power parity (PPP). Singapore has been committed to transitioning from a manufacturing-based economy to a service-oriented economy, with its achievements in green economic development gaining widespread recognition internationally. By 2022, the value added by the service sector accounted for approximately 80% of Singapore's GDP. The continuous increase in the service sector's share demonstrates the significant success of Singapore's green economy development domestically.

Singapore's research and development in green technology is at the forefront globally. The government places a high priority on innovation and development in green technology, encouraging enterprises, universities, and research institutions to increase R&D investments through financial support and policy incentives, leading to breakthroughs and applications in a variety of green technologies. The application of these green technologies has not only enhanced resource efficiency and reduced environmental pollution but has also injected robust momentum into the development of Singapore's green economy.

Additionally, Singapore's green industries are flourishing. The government actively fosters the growth of green industries through policy support and financial subsidies, facilitating their rapid development. Singapore's green industries encompass a wide range of fields, including clean energy, green buildings, and green transportation, thereby forming a complete green industrial chain. The development of these green industries not only provides new growth opportunities for Singapore's economy but also promotes the optimization and upgrading of the economic structure, enhancing overall economic competitiveness.

In terms of international cooperation in the green economy, Singapore plays a significant role. In 2021, Singapore's total trade volume reached 1.2 trillion US dollars (Kerk, 2022). As one of the world's leading trading nations, Singapore actively participates in global environmental governance and climate change negotiations, promoting international collaboration to address global environmental challenges. In 2019, Singapore introduced a carbon pricing mechanism that imposes a carbon tax on medium and large emitters. Starting from January 1, 2024, the carbon tax rate will be raised to 25 Singapore dollars per ton. Alongside the increase in carbon tax, Singapore has also collaborated with international partners to introduce advanced green technologies and management practices, while expanding the international market for green products and services, thereby enhancing the global influence of Singapore's green economy.

## 2.3. Analysis of Key Elements in Singapore's Green Economy

The successful development of Singapore's green economy relies on a series of key elements. Central to this success is the strong impetus from the government. The

Singaporean government places significant emphasis on the development of the green economy, viewing it as a critical strategic direction for national development. Through the formulation of policies and regulations, provision of financial support, and implementation of policy incentives, the government guides and supports the growth of green industries. Additionally, it strengthens cooperation and communication with the international community to promote the globalization of the green economy.

Moreover, technological innovation serves as an essential pillar for the advancement of Singapore's green economy. The country has made substantial investments in green technology research and development, creating an innovative ecosystem that encompasses various sectors, including clean energy, green buildings, and green transportation (Lin, 2018). The application of these green technologies not only enhances resource utilization efficiency and reduces environmental pollution but also provides robust technological support for Singapore's green economic development.

Furthermore, the vigorous growth of green industries is a significant hallmark of Singapore's green economy. The government actively fosters the development of green industries through policy support and financial subsidies, facilitating their rapid expansion. Notably, Singapore has made strides in clean energy, with solar photovoltaic capacity increasing tenfold over the past decade, reaching 1,000 megawatts in 2021 (Tseng, 2022). The growth of green industries not only provides new growth opportunities for Singapore's economy but also promotes the optimization and upgrading of its economic structure, enhancing overall economic competitiveness.

Additionally, widespread public participation is a crucial factor in the development of Singapore's green economy. The government has enhanced environmental education and promoted green consumption concepts to raise public awareness of environmental issues, thereby fostering the formation and development of the green consumer market. This broad public engagement not only provides ample market space for the growth of green industries but also drives the proliferation and deepening of the green economy.

Lastly, the deepening of international cooperation and exchanges offers significant opportunities for the development of Singapore's green economy. Singapore actively participates in international green economic cooperation and dialogue, strengthening policy discussions and project collaborations with other nations to jointly advance global green economic development. Through international collaboration, Singapore has not only introduced advanced green technologies and management practices but also expanded the international market for green products and services, thereby enhancing the global competitiveness of its green economy.

### **3. Current Status and Challenges of Shanghai's Green Economy**

#### **3.1. Progress in the Transition of Shanghai's Green Economy**

As China's leading economic city, Shanghai has made significant strides in its

transition to a green economy in recent years. With increasing national emphasis on green development, Shanghai has actively responded to these initiatives, positioning green economy as a vital engine for sustainable urban growth (Liu & Zhang, 2022a). In terms of industrial restructuring, Shanghai has vigorously promoted the transformation and upgrading of traditional industries, reducing the proportion of high-pollution and high-energy-consumption sectors while actively developing green industries such as renewable energy and energy efficiency. Relevant data indicate that the scale of green industries in Shanghai has been steadily expanding, with their value added to GDP rising annually, becoming a new driving force for economic growth. As of October 17, 2024, the scale of the green low-carbon industry in Baoshan District, Shanghai, has rapidly increased to 47.6 billion yuan in the first half of this year. It is projected that the total scale of Baoshan's green low-carbon industry will exceed 100 billion yuan by the end of the year, surpassing the target set at the beginning of the year "Green Finance Empowers Enterprises' Low-Carbon Transition; Baoshan's Green Low-Carbon Industry Scale Expected to Exceed 100 Billion Yuan". The entire city of Shanghai plans to achieve a green low-carbon industry scale of 500 billion yuan by 2025 Source: People's Daily Online. As the scale of the city's green industry continues to expand, the value added of the green industry as a proportion of GDP has been increasing year by year, becoming a new driving force for economic growth in Shanghai.

Furthermore, Shanghai places great importance on urban greening and ecological environment construction. Through a series of greening initiatives, such as the establishment of urban parks and enhancement of green space systems, the city's greening coverage has significantly improved, providing residents with a more livable environment. Additionally, Shanghai has intensified its environmental protection efforts, increasing remediation actions against polluting enterprises, leading to continuous improvements in air and water quality. These measures not only enhance the city's ecological quality but also lay a solid foundation for the development of the green economy.

In terms of green technology innovation, Shanghai has also made positive progress. By strengthening cooperation among industry, academia, and research, the city has promoted the research, development, and application of green technologies, achieving significant results in areas such as renewable energy and energy efficiency. The application of these green technologies has improved resource utilization efficiency, reduced environmental pollution, and injected new vitality into the development of the green economy.

### **3.2. Challenges Facing Shanghai's Green Economy**

Despite the notable progress in the transition to a green economy, Shanghai faces several challenges. Firstly, as a megacity, Shanghai has a high population density and resource consumption, resulting in immense pressure on environmental protection and ecological construction. With the acceleration of urbanization, constraints on ecological elements such as land and water resources have become

increasingly prominent, posing significant challenges to the development of a green economy.

Secondly, research, development, and application of green technologies still require further strengthening. Although Shanghai has achieved some results in green technology innovation, there remains a gap compared to international advanced levels. This is particularly evident in critical core technology areas, such as renewable energy and energy efficiency, where Shanghai's capacity for independent innovation needs improvement. In comparison to some developed countries, China's investment in areas such as the green economy and green energy is relatively insufficient, and the channels for obtaining green financing remain somewhat limited (Liu & Zhang, 2022b).

Additionally, the role of market mechanisms in the allocation of green resources has not yet been fully realized. Currently, the development of Shanghai's green economy primarily relies on government initiatives and policy guidance, with market mechanisms not being fully unleashed. This reliance limits the internal motivation and market vitality essential for the development of the green economy.

Lastly, the financing system for the green economy requires further improvement. The development of a green economy necessitates substantial financial investment; however, the current development of green finance in Shanghai is relatively lagging, with insufficient innovation and application of financial products such as green loans and green bonds. This limitation constrains the rapid development of the green economy to some extent.

### **3.3. Policy and Regulatory Foundation for the Development of Shanghai's Green Economy**

To promote high-quality development of the green economy, the Shanghai Municipal Government has introduced a series of policies and regulations. These measures encompass various aspects, including the cultivation of green industries, the promotion of energy-saving and environmental protection technologies, and the guidance of green consumption, thereby providing a robust institutional guarantee for the development of the green economy.

In terms of cultivating green industries, the Shanghai Municipal Government implemented the "Regulations on Promoting the Green Transformation of Development Modes in Shanghai" on January 1, 2024. This regulation aims to facilitate the green transformation of Shanghai's energy, industrial structure, and consumer lifestyle through government guidance, market leadership, and multi-stakeholder governance, ultimately achieving green, low-carbon, and high-quality development. Additionally, the city has strengthened planning and layout for green industries, promoting the formation and development of green industry clusters.

To advance green economic development, Shanghai has also formulated the "Regulations on the Development of Green Finance in Pudong New Area," which provides a solid foundation for the growth of green finance in Pudong. Effective from July 2022, this regulation aims to enhance the service level of green finance,

promote the integration of green finance with inclusive finance and technology innovation finance, and advance the construction of the core area of Shanghai's international financial center. It clarifies the responsibilities of the government, financial institutions, and third-party organizations in green finance activities, supports financing for green projects, encourages innovation in financial products, and establishes a solid regulatory foundation for the development of the green economy.

In guiding the management of green buildings, Shanghai has developed the "Management Measures for Green Buildings." Published on September 30, 2021, these measures aim to promote the development of green buildings, conserve resources, and improve the living environment. They define green buildings, outline their applicable scope and management responsibilities, and specify requirements during the construction, operation, and renovation phases. Moreover, the measures encourage the adoption of new technologies and processes, promote smart construction and industrialized building methods, and strengthen regional cooperation and the role of industry associations, providing solid policy and regulatory support for the comprehensive development of green buildings.

The implementation of these policies and regulations provides strong institutional support for the development of Shanghai's green economy. In the future, with ongoing improvements to these policies and increased enforcement efforts, Shanghai's green economy is expected to achieve even higher quality development.

## **4. Insights from Singapore's Green Economy for the High-Quality Development of Shanghai's Green Economy**

### **4.1. Strategic Planning and Policy Support**

The success of Singapore's green economy is primarily attributed to its long-term strategic planning and robust policy support. Since its independence, the Singaporean government has prioritized environmental protection alongside economic development, formulating a series of green initiatives to guide national growth. The Singapore Green Plan 2030 clearly outlines five key goals: "City in Nature," "Sustainable Living," "Energy Reset," "Green Economy," and "Resilient Future," providing a clear roadmap for the high-quality development of its green economy (Chng & Ong, 2021).

For Shanghai, the experience of Singapore suggests that achieving breakthroughs in high-quality green economic development requires the formulation of long-term and specific strategic plans. Shanghai should tailor its plans to its unique circumstances, clearly identifying priority areas and phased goals for green economic development, and introduce a series of supporting policies to ensure effective implementation. These policies should encompass financial support, tax incentives, and green finance, motivating businesses and individuals to actively participate in green economic activities. Moreover, the government must strengthen oversight to ensure the effective execution of these policies and prevent occurrences

of “greenwashing.” Therefore, the government should also strengthen supervision to ensure the effective implementation of various policies and to prevent the occurrence of “greenwashing” (Zhu, 2023).

#### **4.2. Technological Innovation and Industrial Upgrading**

Singapore has achieved remarkable results in technological innovation and industrial upgrading within its green economy. The government encourages enterprises to invest in green technology research and development by establishing special funds and providing R&D support, facilitating the transition of traditional industries toward green, low-carbon practices. Notably, Singapore has made significant breakthroughs in the research and application of renewable energy technologies, such as solar and hydrogen energy, providing strong support for the development of its green economy.

As China’s economic hub, Shanghai should draw lessons from Singapore’s experience by increasing investments in green technological innovation. On one hand, the government should establish dedicated funds for green technology R&D to support enterprises and research institutions in conducting cutting-edge technology research. On the other hand, through policy guidance, businesses should be encouraged to adopt advanced green production processes and equipment, facilitating the low-carbon transformation of traditional industries. Additionally, Shanghai should actively foster emerging green industries, such as energy efficiency and clean energy, to cultivate new economic growth drivers.

#### **4.3. Social Participation and Public Education**

Singapore places a strong emphasis on social participation and public education in the development of its green economy. The government organizes various environmental activities and conducts green awareness campaigns to enhance public understanding of environmental issues and to stimulate enthusiasm among all sectors of society for participating in green economic initiatives. Additionally, the government encourages enterprises to assume social responsibility, promoting both green consumption and green production.

In the process of advancing high-quality green economic development, Shanghai should similarly focus on fostering social participation and public education. The government can leverage media campaigns and community activities to disseminate knowledge about sustainability and elevate public environmental awareness. Moreover, businesses should be encouraged to engage actively in green philanthropic efforts to cultivate a positive green corporate image. Shanghai could also adopt Singapore’s approach by establishing mechanisms to incentivize green consumption, guiding consumers to choose eco-friendly products and services, thus fostering a culture of sustainable consumption.

#### **4.4. International Cooperation and Open Markets**

As a highly open city-state, Singapore actively participates in international cooperation in the green economy, leveraging foreign investment and technology to



propel rapid growth in this sector. Furthermore, Singapore engages in the formulation of international green regulations, enhancing its influence in the global green economy.

For Shanghai, Singapore's international cooperation experience offers significant insights. Shanghai should proactively engage in international green economic cooperation projects, attracting advanced green technologies and management practices. Additionally, it should further open its markets to draw in foreign investments and technologies in the green economy sector, thus promoting high-quality development. Furthermore, Shanghai should actively participate in the formulation and refinement of international green regulations, enhancing its voice and influence in the global green economy and contributing Shanghai's wisdom to the global pursuit of sustainable development.

## 5. Conclusion

Singapore, as a resource-scarce island nation, has successfully transformed into a globally recognized "Garden City" by implementing a series of innovative green development strategies. This experience provides valuable insights and lessons for Shanghai's green economic transition. Shanghai should emulate Singapore's successful practices by formulating long-term and specific strategic plans, increasing investments in green technological innovation, emphasizing social participation and public education, and actively engaging in international green economic cooperation. Through these concerted efforts, Shanghai is poised to become a model for global green economic transformation, offering a replicable pathway and framework for other cities.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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