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SINGAPORE'S ENTERPRISE SUPPORT MODEL FOR GREEN ECONOMIC DEVELOPMENT AND ITS IMPLICATIONS FOR VIETNAM

O modelo de apoio empresarial de Singapura para o desenvolvimento econômico verde e suas implicações para o Vietnã

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ABSTRACT

The "Keep Singapore Clean" campaign was initiated by Prime Minister Lee Kuan Yew shortly after Singapore gained independence. Since then, environmental protection has remained a central component of the nation's socio-economic development strategies. In response to the global challenge of climate change, Singapore introduced the Carbon Tax Act on January 1, 2019, applying to all industrial facilities emitting 25,000 tons or more of greenhouse gases annually. The policy aims to encourage businesses to adopt cleaner and more sustainable technologies while minimizing carbon emissions into the environment. To achieve this goal, the government, together with political and social organizations, has actively supported enterprises in developing effective green growth strategies. The success of these initiatives has made Singapore a model of inspiration for other nations grappling with climate change, including Vietnam. Given its own economic characteristics, Vietnam can draw valuable lessons from Singapore's experience in promoting green transformation, particularly in the development of policies related to the emerging "carbon market".

Keywords: Climate change, Green development in Singapore, Carbon credits, Carbon tax, Carbon market

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O MODELO DE APOIO ÀS EMPRESAS DE CINGAPURA PARA O DESENVOLVIMENTO ECONÔMICO VERDE E SUAS IMPLICAÇÕES PARA O VIETNÃ

Singapore's enterprise support model for green economic development and its implications for Vietnam

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RESUMO

A campanha "Mantenha Singapura Limpa" foi iniciada pelo Primeiro Ministro Lee Kuan Yew logo após Singapura conquistar a independência. Desde então, a proteção ambiental tem permanecido um componente central das estratégias de desenvolvimento socioeconômico do país. Em resposta ao desafio global das mudanças climáticas, Singapura introduziu a Lei do Imposto sobre o Carbono em 1º de janeiro de 2019, aplicável a todas as instalações industriais que emitem 25.000 toneladas ou mais de gases de efeito estufa anualmente. A política visa incentivar as empresas a adotarem tecnologias mais limpas e sustentáveis, minimizando as emissões de carbono para o meio ambiente. Para atingir esse objetivo, o governo, juntamente com organizações políticas e sociais, tem apoiado ativamente as empresas no desenvolvimento de estratégias eficazes de crescimento verde. O sucesso dessas iniciativas tornou Singapura um modelo de inspiração para outras nações que lutam contra as mudanças climáticas, incluindo o Vietnã. Dadas as suas próprias características econômicas, o Vietnã pode extrair lições valiosas da experiência de Singapura na promoção da transformação verde, particularmente no desenvolvimento de políticas relacionadas ao emergente "mercado de carbono".

Palavras-chave: Mudanças climáticas, Desenvolvimento verde em Singapura, Créditos de carbono, Imposto sobre o carbono, Mercado de carbono

INTRODUCTION

The concept of the "green economy" first appeared in 1989 in the report *Blueprint for a Green Economy,* commissioned by the Government of the United Kingdom and authored by David Pearce and his colleagues. The report aimed to advise the British government on tools for measuring economic progress, assessing projects, and evaluating economic policies in pursuit of sustainable development. Since then, numerous definitions of the term have been proposed. The United Nations Environment Programme (UNEP) conceptualized the "green economy" in its publication *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, defining it as an economy that substitutes renewable energy and low-carbon technologies for fossil fuels, a low-carbon, resource-efficient, and socially inclusive economy (UNEP, 2011). Carbon emission reduction is thus considered the central strategy for realizing a green economy and achieving sustainable development. Over the past decade, green growth and carbon reduction have become key priorities in the socio-economic development policies of most countries around the world.

As two nations located at the gateway to Southeast Asia - one of the most dynamic regions globally - Vietnam and Singapore share certain similarities in their developmental starting points. Both were former colonies that, upon gaining independence, placed economic development at the forefront of their social policy agendas. At different historical junctures, each country underwent transformative shifts that propelled economic growth and international integration. Influenced by both objective and subjective factors, Vietnam launched its *Đổi mới* (Renovation) policy in 1986, prioritizing economic growth and global integration as both the driving force and goal of national development. In 1965, following its separation from Malaysia, Singapore centered its socio-economic development strategy on industrialization and attracting foreign investment. Both nations emphasized internal capacity building and human development as the foundation for achieving sustainable growth, environmental protection, and social equity.

In pursuit of sustainable economic development, Singapore became the first country in Southeast Asia to implement a carbon tax under the *Carbon Pricing Act*, which took effect on January 1, 2019 (MSE, 2024). The Act requires organizations and individuals emitting greenhouse gases to account for their environmental impact. According to its *Nationally Determined Contribution* (NDC), Singapore has set the goal of achieving net-zero emissions by 2050 (NCCS, 2025). This ambitious carbon reduction target has also created new opportunities for employment, technological innovation, and social well-being. The Singaporean government has introduced a range of effective models and measures to accompany and support enterprises in meeting these objectives.

Similarly, Vietnam is progressively refining its carbon reduction policies with the same goal of achieving net-zero emissions by 2050. The development of a carbon market is viewed as a vital and feasible solution for Vietnam to fulfill its international commitments on emission reduction and to promote clean and renewable energy. Entering the carbon policy landscape later than Singapore offers Vietnam the advantage of learning from Singapore's enterprise support models and carbon tax mechanisms. Through such lessons, Vietnam - in collaboration with businesses, economic sectors, and its citizens - can advance toward building a successful, sustainable, and environmentally responsible green economy.

1 TAX POLICIES AND ENTERPRISE SUPPORT MODELS FOR GREEN DEVELOPMENT IN SINGAPORE

To achieve its "net-zero carbon" target by 2050, the Singaporean government has actively collaborated with businesses and citizens through various tax incentives and enterprise support schemes. These policies aim to encourage investment in green technologies and address broader socio-economic concerns. Several key tax measures and support models have been implemented to facilitate technological innovation and promote sustainable business practices.

First, the Refundable Investment Credit (RIC) Scheme. In February 2024, the Singapore government introduced the Refundable Investment Credit (RIC) policy to stimulate investment in new technologies and reduce carbon emissions. Approximately USD 1.5 billion (UNCTAD, 2024) was allocated from the National Productivity

Fund to reimburse enterprises that meet specific criteria, including investments in research and development for low-carbon manufacturing facilities and projects designed to achieve carbon reduction goals.

Under this scheme, the RIC covers a wide range of eligible expenses, such as capital expenditure, training costs, professional fees, intangible assets, outsourcing, raw materials, consumables, and logistics expenses. Each qualifying investment may receive up to 50% support (EY, 2024), subject to approval by the Economic Development Board (EDB) and Enterprise Singapore (EnterpriseSG). The support level is proportionate to the expected decarbonization outcomes of the projects.

Refundable credits are granted for eligible expenditures incurred during a project's implementation period up to ten years, starting from 2024. These credits are offset against corporate income tax and may be refunded in cash within four years, once the enterprise submits a report demonstrating full compliance with refund conditions.

Although investment in advanced green technologies often entails high costs and can affect Singapore's global competitiveness in the short term, effective implementation of the RIC scheme will strengthen Singapore's position as a regional clean energy hub. Moreover, it serves as a vital driver of added value across economic, political, and social activities linked to the nation's sustainable development agenda.

Second, the Enterprise Sustainability Programme (ESP) of the Ministry of Trade and Industry (MTI), Singapore. Launched on October 4, 2021, the Enterprise Sustainability Programme (ESP) was initiated with a budget of SGD 180 million (approximately USD 133 million) funded by the Ministry of Trade and Industry. The programme aims to strengthen the capacity of Singaporean enterprises and help them seize opportunities within the green economy. It is projected that around 6,000 enterprises will benefit from this policy. The ESP represents one of the government's key efforts to advance the *Singapore Green Plan 2030*.

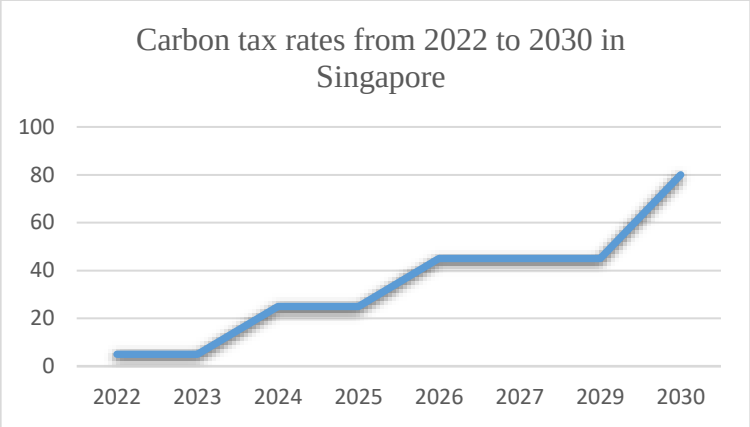
The programme comprises three main components: (1) fostering sustainable enterprise development; (2) enhancing enterprise-specific capabilities; and (3) promoting a dynamic and sustainable business ecosystem. Under this framework, the government provides enterprises with access to specialized training and capacity-building workshops designed to raise awareness, deepen understanding, and equip firms with practical tools for long-term sustainability planning.

Additionally, the ESP supports enterprises in optimizing resource efficiency and adopting sustainability standards related to emissions reduction. Beyond internal improvements, the programme also facilitates the development of sustainable products, services, and innovative solutions to capture emerging opportunities in the green economy.

Partnership and collaboration are central to the ESP. The programme works closely with industry associations and public agencies to promote cross-sectoral cooperation and deliver sector-specific training. Its main partners include the Singapore Contractors Association Limited (SCAL), the Textile and Fashion Federation (TaFF), and the Singapore Furniture Industries Council (SFIC). Through these collaborations, the ESP helps enterprises strengthen sustainability capabilities across their entire value chain, contributing to the creation of a robust and adaptive green business ecosystem.

Third, the Carbon Tax Policy Supporting Enterprise Emission Reduction. The carbon tax represents one of Singapore's most decisive policy instruments to support enterprises and society in achieving a net-zero emissions target. It also serves as a crucial market signal, encouraging producers and consumers to shift away from carbon-intensive goods and services. This mechanism fosters corporate accountability for greenhouse gas emissions and motivates enterprises to seek effective carbon reduction strategies. Based on the "polluter pays" principle, Singapore's carbon tax rate has been designed to progressively increase from 2022 to 2030, ensuring that businesses internalize the environmental costs of their emissions while accelerating the national transition toward a low-carbon economy.

Figure 1 - Carbon tax rates in Singapore over the years



Source: author's synthesis

Accordingly, the carbon tax was set at SGD 5 per tonne of carbon dioxide equivalent (tCO_2e) for the period 2019–2023. Beginning in 2024, the rate increased to SGD 25/tCO_2e and is expected to rise to SGD 45/tCO_2e in 2026–2027, with a target range of SGD 50–80/tCO_2e by 2030 (NCCS, 2025). Under *Part 2: Regulation of Industries and Dependencies, Section 3 – Application of the Carbon Pricing (Amendment) Regulations 2018*, the tax is not imposed on all enterprises but specifically targets large industrial facilities with direct annual greenhouse gas (GHG) emissions of at least 25,000 tCO_2e. In Singapore, the industrial and energy sectors are the primary contributors to carbon emissions, while other sectors emit smaller, less significant amounts. This targeted taxation approach ensures that the largest emitters bear the principal responsibility for decarbonization, aligning with the nation's broader strategy for sustainable and inclusive green growth.

Nevertheless, the carbon tax inevitably affects end consumers, as large corporations often increase product prices to offset additional tax expenses. On average, every SGD 5/tCO_2e increase in the carbon tax may result in about a 1% rise in electricity prices. However, the Singaporean government does not view the carbon tax as a means of increasing national revenue. Instead, the tax proceeds are reinvested to support both enterprises and households in the green transition through three primary channels: revenue from the carbon tax is allocated to enterprise support schemes, such as the *Enterprise Sustainability Programme (ESP)*. These funds are used to assist companies in continuing their investment in green technologies, improving production efficiency, and enhancing international competitiveness through innovation and emission reduction; beyond enterprise-level support, part of the carbon tax revenue is used to help households adopt emission-reduction solutions, including the installation of solar panels and the improvement of energy efficiency in residential buildings. The government has committed to assisting families in coping with increased living costs caused by the carbon tax and other economic factors. Through the *U-Save* scheme, financial assistance is provided to households to offset higher utility bills resulting from carbon tax adjustments. In the 2024 fiscal year, eligible households under the U-Save programme may receive up to SGD 950 in support (NCCS, 2025). Furthermore, the Singaporean government works closely with the Consumers Association of Singapore (CASE) and the Competition and Consumer Commission of Singapore (CCCS) to monitor the market and prevent excessive price hikes by retailers; carbon tax revenue also funds emission-reduction programs through several major sustainability funds, including: The Resource Efficiency Grant for Energy (REG(E)), which supports projects developing new energy sources; The Energy Efficiency Fund (E2F), dedicated to enhancing industrial energy efficiency; The SG Eco Fund, a SGD 50 million initiative launched by the Ministry of Sustainability and the Environment (MSE) to finance public and private sector projects that promote environmental protection and sustainable innovation; and The 3R Fund, which provides co-financing for waste reduction projects in waste management facilities;

Fourth, the Resource Efficiency Grant for Emissions serves as a targeted financial package designed to assist industrial facilities and data centers in researching and adopting emission-reduction technologies, ensuring their competitiveness in a future low-carbon economy. To qualify for REG(E) funding, enterprises must meet two

key criteria: The emission-reduction project must be implemented at an industrial facility or data center located in Singapore, and the project must demonstrate measurable and verifiable carbon abatement or capture equivalent to at least 250 tonnes of CO_2 per year.

A distinctive feature of this grant is that applicants are required to include a detailed measurement and verification plan as part of their proposal. This plan must be validated by independent, qualified organizations with recognized expertise in emission auditing.

Through these comprehensive policies, Singapore has developed a coherent, multi-tiered approach that balances economic competitiveness with environmental responsibility — providing valuable insights for other nations, including Vietnam, in designing effective carbon governance frameworks.

Fifth, the model supports workers in skill enhancement and labor force regeneration for the green transition. According to the *Global Green Skills Report 2022*, green skills and green jobs are indispensable requirements for promoting the green transition. The report also indicates that by 2026, demand for green-skilled labor will exceed supply by 2%, and this gap will continue to widen unless the workforce upgrades its green competencies (*LinkedIn Economic Graph, 2022*). Therefore, Singapore's transition toward a green, low-carbon, and sustainable economy is inseparable from the process of improving workers' skills and qualifications.

This program assists workers in acquiring new competencies to seize employment opportunities emerging within green enterprises. It represents a joint effort between the state, trade unions, vocational training institutions, and industrial associations to design training programs tailored for workers in the green economy. To support the development of a vibrant carbon business and services ecosystem, the *Economic Development Board (EDB)* and *Enterprise Singapore (EnterpriseSG)* have collaborated with the *National University of Singapore (NUS)* and *Nanyang Technological University (NTU)* to develop specialized training programs in carbon management, services, and trading. These initiatives help address the demand for human resources, identify skill gaps in the green economy, and create internship opportunities within green companies for university students.

This model contributes both to local human resource development and to the expansion of Singapore's pool of green economy experts. Training courses aimed at upskilling, capturing new opportunities, and raising awareness about sustainability in the green economy are regularly offered and subsidized by *EnterpriseSG* through the *SkillsFuture Credit* system.

Sixth, other effective enterprise support models include the Energy Efficiency Grant (EEG) scheme. Launched in 2022, this model aims to assist businesses in sectors such as retail, food services, and food manufacturing—and is gradually expanding to other industries—by co-funding corporate investments in energy-efficient equipment as part of the nation's green and sustainable development. Since its inception, approximately 2,000 enterprises have participated and received support under this program (*DEB, 2024*).

Another key initiative is the *Expansion of the Enterprise Financing Scheme (EFS–Green)*. Introduced in October 2021 and implemented until March 31, 2026, this short-term program enables Singaporean enterprises to access better green technologies and solutions, thereby capturing opportunities within the green economy. *EFS–Green* provides 70% risk-sharing on loans extended by financial institutions to enterprises. In addition, it supports the development of green solutions classified as "green" or "amber" under the new *Singapore Asia Taxonomy*. This taxonomy offers science-based criteria ensuring that enterprises under *EFS–Green* can access reliable financing for adopting carbon-reduction technologies, accelerating Singapore's green transition.

Overall, the success of Singapore's green economy depends on multiple factors. A key driving force lies in the government's strong awareness and decisive action in positioning the green and sustainable economy as a fundamental national development strategy. This feature typifies the Singaporean economic model, in which the state plays an active and interventionist role, supported by public agencies and enterprises considered the main engines of development success (*Saim Karabulut, 2024*). Through pragmatic policies, financial incentives, and preferential regulations, the Singaporean government, in collaboration with scientists, has guided and supported enterprises in implementing green development strategies.

Moreover, the nation's commitment to technological innovation, research, and the application of advanced science and technology constitutes another key pillar of green growth. The island nation has built a comprehensive innovation ecosystem encompassing clean energy, green buildings, and green transportation (*Lin, 2018*). The

application of green technologies not only enhances resource efficiency and reduces environmental pollution but also provides robust technological foundations for Singapore's green economic expansion.

Equally important is the broad participation of citizens, which plays a decisive role in the success of Singapore's green economy. The government has strengthened environmental education in schools and enterprises, promoted green consumption, and raised public environmental awareness, thereby shaping and expanding the green consumer market. The active involvement of citizens serves as the fundamental driver for deepening and sustaining green economic development across the entire Singaporean economy.

Finally, Singapore's *Carbon Tax Law* represents a groundbreaking government initiative aimed at ensuring the achievement of future environmental and sustainability goals. However, the implementation of the carbon tax and the evolving realities of the economy have compelled the nation to explore complementary mechanisms, most notably the establishment of a *carbon market* to enable carbon credit trading with other countries, thereby advancing the collective development of the green economy.

2 OVERVIEW OF THE LEGAL FRAMEWORK AND CHALLENGES IN DEVELOPING A GREEN ECONOMY IN VIETNAM

2.1 Legal basis and policies for green economic development in Vietnam

The first legal foundation for the green economy and environmental protection in Vietnam is enshrined in Article 43 of the 2013 Constitution of the Socialist Republic of Vietnam, which stipulates: *"Everyone has the right to live in a healthy environment and has the obligation to protect the environment."* Furthermore, Article 63 provides that: *"The State shall adopt policies on environmental protection; manage and use natural resources efficiently and sustainably; conserve nature and biodiversity; and proactively prevent and respond to natural disasters and climate change."*

Demonstrating its proactive stance in international integration, Vietnam has joined the United Nations Framework Convention on Climate Change (UNFCCC) and ratified the Paris Agreement on Climate Change under Resolution No. 93/NQ-CP dated October 31, 2016. To operationalize this commitment, the Prime Minister issued Decision No. 2053/QĐ-TTg dated October 28, 2016, approving the *Plan for Implementation of the Paris Agreement on Climate Change*. Even before these, Vietnam had embraced the global trend toward sustainable and green development. The concept of sustainable development and a green economy was articulated in the Party's Documents of the 9th, 10th, 11th, and 12th National Congresses. In the Documents of the 13th National Congress, the Communist Party of Vietnam further emphasized: *"Encourage green, clean, ecological, organic, high-tech, and climate-resilient agriculture"* (Communist Party of Vietnam, 2021, p. 107), and *"develop a green economy, a circular economy, and an environmentally friendly economy"* (Communist Party of Vietnam, 2021, p. 331).

Following the Party's orientation, the Government has issued a series of policies to promote green economic development. Among these, the most notable are: Decision No. 1393/QĐ-TTg dated September 25, 2012, approving the *National Green Growth Strategy for the 2011–2020 period with a vision to 2050*; Decision No. 882/QĐ-TTg dated July 23, 2022, approving the *National Action Plan on Green Growth for the 2021–2030 period*.

These are considered the most comprehensive documents on green economy development in the current stage. The *National Green Growth Strategy* affirms that: *"Green growth is an important approach to achieving sustainable development, directly contributing to reducing greenhouse gas emissions and moving toward a carbon-neutral economy in the long term."* It also states that: *"Green growth is the endeavor of the entire political system, all people, the business community, and related organizations, driven by innovation and the aspiration for a prosperous and sustainable nation".* The Strategy outlines numerous solutions, including the development of a carbon market aimed at establishing a comprehensive emissions trading system under market mechanisms. To implement this, on January 7, 2022, the Government promulgated Decree No. 06/2022/NĐ-CP on *reducing greenhouse gas emissions and protecting the ozone layer*. This Decree sets out a detailed roadmap for developing and implementing a domestic carbon market.

Specifically: By 2025, a pilot carbon credit exchange will be launched; By 2027, regulations on carbon credit management, greenhouse gas emission quotas, and carbon credit trading will be finalized; Operational rules

for the carbon credit exchange will be developed; Pilot mechanisms for carbon credit exchange and offsetting in potential sectors will be implemented; Guidelines for domestic and international carbon credit exchange and offsetting will be established, consistent with Vietnamese law and international treaties to which Vietnam is a signatory; A pilot carbon credit trading platform will officially operate from 2025; Capacity-building and awareness-raising activities on carbon market development will be conducted.

Thus, while Singapore has implemented greenhouse gas reduction through a Carbon Tax Law before moving toward establishing a carbon market for carbon credit trading, Vietnam identifies the development of a carbon market as the *primary mechanism* for building a green and sustainable economy.

2.2 Overview of the Bottlenecks in the Economy in General and in Enterprises in Particular Regarding Green Development in Vietnam

In the process of economic development, greenhouse gas emissions are inevitable in Vietnam. According to the Nationally Determined Contribution (NDC) Report issued by the Prime Minister in 2022, based on the updated list of sectors and establishments required to conduct greenhouse gas inventories, the level of greenhouse gas emissions across all economic sectors in Vietnam has been increasing steadily year by year.

Table 1 - National greenhouse gas emissions forecast for the period 2020-2030

Year	Energy	Agriculture	LULUCF	Waste	IP	Total
2020	347,5	104,5	-35,4	31,3	80,5	**528,4**
2025	500,7	109,2	-37,9	38,1	116,1	**726,2**
2030	678,4	112,1	-49,2	46,3	140,3	**927,9**

Source: Vietnam NDC technical report, Ministry of Natural Resources and Environment, 2020

The above report shows that the energy production sector has the highest emission level. This is also an objective factor in economic development in Vietnam. Therefore, implementing a green economy has become a huge challenge for the Vietnamese economy in general, as well as for the state's management to implement committed emission reduction targets. The challenges have become bottlenecks for the "Zero Carbon" requirement by 2050 in general and the green economy in particular in Vietnam. The main bottlenecks today can be summarized as follows:

First of all, lack of capital and technology. This is considered the basic bottleneck of the green economy in Vietnam today. According to calculations by the Ministry of Planning and Investment and the World Bank, Vietnam needs about 30 billion USD per year to implement the green growth strategy and sustainable development goals by 2030 (VOH 2022). In 2020, State budget expenditure on environment and climate action accounted for 1.5% of total government expenditure, equivalent to VND 25.6 trillion (Tuyet, 2023). Therefore, green technology investment must be proactively implemented by enterprises, and this is also a difficult obstacle to overcome for Vietnamese enterprises, especially small and medium enterprises, the majority and mainstay of the economy.

Second, many enterprises still do not have a correct understanding of the green economy and emission reduction. In production and business, profit is still the top priority of enterprises. The effectiveness of the green economy does not come in the near future and is not directly linked to business profits. In addition, green economic technology and human resources often exceed the investment capacity of enterprises, especially small and medium enterprises. At present, businesses in Vietnam do not feel the pressure or clear demand from society and customers for green products/services, especially from the domestic market. In addition, the cost of green products is often higher than traditional products, while people's income is still low and their consumption habits have not changed much. The mindset of "doing environmental work is expensive", that the cost and burden of complying with the law still exists instead of seeing it as an opportunity to innovate, improve efficiency, and create competitive advantages. Therefore, small and medium enterprises have little interest in learning about the green economy, and have not made practical investments in technology and human resources in environmental protection.

Third, the infrastructure for green transformation is not commensurate with the requirements. Vietnam has made progress in developing renewable energy, especially solar and wind power, with installed capacity increasing sharply in the past decade. However, the national grid system has not been upgraded to integrate this energy source. Many solar and wind power projects have had to reduce capacity or temporarily stop operations due to grid overload or insufficient transmission capacity from production areas (such as the Central Highlands and South Central Coast) to major consumption areas (North and South). A green economy requires effective management of natural resources and waste reduction through recycling and reuse. However, waste treatment infrastructure in Vietnam is still backward, with most urban waste being buried instead of recycled. Modern treatment plants or waste-to-energy incineration technology are still very few and mainly on a small scale.

3 FROM SINGAPORE'S ENTERPRISE SUPPORT MODELS TO RECOMMENDATIONS FOR PROMOTING GREEN ECONOMIC DEVELOPMENT IN VIETNAM

A key feature of Singapore's emission-reduction strategy is its carbon tax policy. Over time, alongside the carbon tax, Singapore has gradually established laws and regulations for a carbon market, aiming both to achieve emission-reduction targets and to ensure continued economic growth. According to a 2024 survey by *The Straits Times*, 6% of respondents considered the carbon tax very effective, 24.5% considered it effective, and 41.9% considered it moderately effective. Regarding the pace of energy transition, 45.9% of respondents viewed Singapore's progress as promising, while 32.5% believed further improvement was necessary. This indicates that a segment of the population remains unconvinced that the carbon tax alone can achieve the "zero carbon" target by 2050.

From Singapore's experience in building a green economy and pursuing the "zero carbon" goal, Vietnam should consider the following recommendations:

Firstly, continue to improve the institutional and legal framework for the carbon market.

Establishing a carbon market is a fundamental solution for achieving "zero carbon" while maintaining stable and continuous economic growth. Currently, growth remains crucial for ensuring citizens' livelihoods and enabling emission reductions. A carbon market is appropriate for Vietnam's economic context. Singapore's legal framework, implementation roadmap, target groups, and emission-reduction mechanisms are already well developed, requiring only minor adaptations to local conditions. In contrast, Vietnam, despite pursuing the same goals, still lacks detailed subordinate legal documents (excluding drafts), such as decrees or circulars guiding operation procedures, allocation of emission quotas, mechanisms for carbon credit trading, standards for monitoring, reporting, and verification (MRV), as well as sanctions and enforcement measures. Therefore, comprehensive and coherent legislation, particularly regarding carbon credit trading and all aspects related to the green economy and environmental protection, is an urgent requirement in Vietnam.

Secondly, strengthen financial incentives and support mechanisms for green investment.

To achieve "zero carbon," Singapore has established numerous credit funds and preferential policies that encourage green investment, supported by the state, socio-political organizations, businesses, and citizens. In Singapore, green economic support even extends to households that meet emission-reduction requirements. Environmental protection laws have thus become effective and enforceable management tools.

Vietnam has initiated similar measures, including: Environmental protection taxes; Corporate income tax incentives, including tax exemptions of up to four years for environmentally protective projects, and exemptions for enterprises allocated emission-reduction certificates; Export and import tax regulations offering exemptions or high tariffs on environmentally harmful goods; Policies promoting green production and consumption.

However, the effectiveness of these legal and fiscal instruments is limited. They have not yet become robust enforcement tools or significantly altered the behavior and awareness of economic actors, particularly small and medium-sized enterprises (SMEs). Therefore, Vietnam needs to review and update tax policies in line with general economic development, ensuring that tax incentives serve both as motivation and as strategic objectives for individual enterprises.

Singapore's experience also highlights the role of state-supported or state-facilitated green investment funds, with clear criteria, objectives, and methods tailored to different enterprise targets and stages of green

investment. Vietnam possesses considerable potential for green economic development, but efforts to establish green investment funds remain slow. Currently, there is only one ESG (Environmental-Social-Governance) sustainable development investment fund with USD 14 million in capital, insufficient to stimulate green investment.

Diversifying green bond issuance is another effective financing channel for sustainable development. Green bonds in Vietnam have become a prominent and preferred option for businesses investing in green initiatives. However, it is necessary to strengthen the legal framework and raise awareness of the role of green bonds in supporting sustainable development.

Thirdly, promoting technological innovation as a key driver for green economic development.

In Singapore, green development is closely linked to technological innovation. Policies, investment funds, and incentives are primarily directed toward supporting new technology development. In contrast, technology remains a significant bottleneck for green economic growth in Vietnam. The country currently faces limitations in developing core technologies, with few domestically created innovations; most enterprises still rely on imported technologies.

In the current era, digital technologies have become essential tools for building a green economy and protecting the environment. Therefore, the Vietnamese state must play a leading role in mobilizing and facilitating resources, including policy frameworks, public investment, and incentives for research and innovation. Enterprises should be encouraged to experiment with and adopt new technologies, especially digital technologies, in production processes. Furthermore, the state should strengthen human resource development by providing high-quality training in green economy sectors, integrating green development into education curricula, organizing training programs, and offering technical support to enterprises, particularly small and medium-sized enterprises (SMEs). This will enable broader adoption of digital tools for management, monitoring, forecasting, and mitigating environmental risks.

Additionally, the state should act as a connector in public–private partnerships, linking traditional businesses with green enterprises. This fosters market connectivity, information and technology sharing, capacity building, and incentivizes traditional enterprises to transition toward sustainable practices.

Fourthly, raising public awareness and fostering a green culture. Human awareness and behavioral change play a pivotal role in the success of social and economic development strategies. In Singapore, citizens demonstrate high environmental consciousness regarding green economy, green products, green energy, and sustainable urban living. Vietnam must similarly focus on enhancing awareness among both citizens and enterprises, particularly SMEs, regarding green markets and sustainable products and services. Strategies may include maintaining campaigns such as “green–clean–beautiful” in everyday life, leveraging media channels—including press, television, and social media—to communicate the benefits of a green economy and the adverse health impacts of environmental pollution. Moreover, Vietnam should organize seminars, workshops, and public dialogues on environmental protection, food safety, and government-supported green initiatives across all educational levels and communities. Such initiatives help cultivate responsible consumption habits, encourage preference for safe and sustainable products, and gradually establish a green market, thereby promoting comprehensive social participation in sustainable development.

The success of green economic development and environmental protection in Vietnam depends on long-term, serious, and accountable planning by the state apparatus. Policies supporting enterprises with clear criteria and objectives, along with fiscal instruments like targeted tax laws designed to incentivize green practices, provide valuable lessons. By adapting these approaches to Vietnam’s specific context, the country can effectively build a green economy and achieve the “zero carbon” target by 2050.

CONCLUSION

Singapore, as a developed country, has early on implemented decisive state policies on green economy and sustainable development closely linked with environmental protection. The Singaporean government does not leave citizens and businesses to adapt independently to policies and laws; rather, it provides close monitoring, support, and facilitation to ensure a synchronized and sustainable societal development. A prominent feature of the policies supporting businesses toward a “zero carbon” economy is the carbon tax, accompanied by state-backed financial

funds aimed at assisting businesses and households in reducing carbon emissions in their production and daily activities. The majority of these public financial resources are consistently allocated to the development of new technologies, including technologies adapted to global climate change and emissions reduction. As a result, Singapore's labor productivity remains among the highest in the world.

Although Vietnam is at a later stage of development, this position offers an opportunity to draw lessons from the successes and shortcomings of other countries in general, and Singapore in particular. Based on insights from Singapore's green economy strategy, Vietnam has committed to continuing the development of a policy and legal framework suitable to its practical conditions in order to build a "carbon market." Furthermore, the Vietnamese government must persist in strengthening institutional capacity for the establishment and deployment of public and private credit funds, as well as general tax policies, with the spirit of supporting and accompanying businesses—especially small and medium-sized enterprises—in pursuing the shared global objectives of sustainable development.

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