Southeast Asia Development Research
https://journals.zycentre.com/sadr

ARTICLE

Foreign Investment Trends in Sustainable Industrial Parks in the Hai Phong City of Vietnam

Alessandro Flammini [1*] ***, Ngoc Hai Bui*** [2] ***, Tram Anh Nguyen*** [1] ***, Anh Phu Hoang*** [3] ***, Thanh Trung Nguyen*** [4] ***, Geert Dom*** [5] ***, Van Vuong Nguyen*** [2]

[1] *United Nations Industrial Development Organization, A-1400 Vienna, Austria*
[2] *Hai Phong Economic Zone Authority, Hai Phong 15000, Vietnam*
[3] *Foreign Investment Agency, Ministry of Finance, Hanoi 10000, Vietnam*
[4] *Green Ventures Vietnam Joint Stock Company, Hanoi 10000, Vietnam*
[5] *International Maritime and Transport Advisors BV, 2170 Antwerp, Belgium*

ABSTRACT

This paper analyzes foreign direct investment (FDI) trends in Hai Phong, Vietnam, with a focus on the transformation of its industrial parks towards sustainable development. Using a mixed-methods approach that combines statistical data with stakeholder insights, the study highlights the city's strategic location, proactive government incentives, and adoption of eco-industrial park (EIP) models as main drivers of its competitiveness. Between 2015 and 2024, Hai Phong attracted more than 1,000 FDI projects with cumulative capital exceeding USD 30 billion, making it the second-largest FDI destination in Vietnam. In 2024 alone, foreign investment inflows into industrial parks and economic zones reached USD 4.35 billion, contributing to an 11% GRDP growth and sustaining double-digit growth for ten consecutive years. Socioeconomic outcomes include a 23.1% increase in the industrial workforce and a 9.5% rise in average monthly income from 2020 to 2023. Sustainability initiatives are advancing rapidly: Deep C Industrial Park pioneered roads built with recycled plastics, Nam Cau Kien developed three industrial symbiosis models, and several parks set targets to source up to 50% of energy from renewables by 2030. However, challenges remain in infrastructure quality, skilled labor availability, regulatory processes,

*CORRESPONDING AUTHOR:
Alessandro Flammini, United Nations Industrial Development Organization, A-1400 Vienna, Austria; Email: alessandro.flammini@gmail.com

ARTICLE INFO
Received: 3 July 2025 | Revised: 24 August 2025 | Accepted: 1 September 2025 | Published Online: 30 August 2025
DOI: https://doi.org/10.63385/sadr.v1i2.334

CITATION
Flammini, A., Bui, N.H., Nguyen, T.A., et al., 2025. Foreign Investment Trends in Sustainable Industrial Parks in the Hai Phong City of Vietnam. Southeast Asia Development Research. 1(2): 12–24. DOI: https://doi.org/10.63385/sadr.v1i2.334

and environmental management, particularly wastewater reuse and rising emissions. The paper concludes with policy recommendations to strengthen infrastructure, workforce skills, regulatory streamlining, and green innovation, positioning Hai Phong as a leading hub for sustainable industrial investment in Southeast Asia.

Keywords: Vietnam; Hai Phong; Foreign Direct Investment (FDI); Sustainable Industrial Parks; EIP; Sustainability; Industrial Development; Circular Economy

1. Introduction

Vietnam's rapid industrialization has redefined its economic landscape, and few places illustrate this transformation more vividly than Hai Phong. As a major coastal city with deep-water ports, a strategic geographic setting, and a forward-looking business environment, Hai Phong has increasingly become a hub for foreign direct investment (FDI). In recent years, the city has attracted billions of dollars through advanced industrial parks, innovative green initiatives, and wide-ranging government policies. In 2024 alone, Hai Phong emerged as one of the leading provinces in the country for FDI, with more than 1,000 projects cumulatively representing upwards of 30 billion USD in capital inflows [1] from 39 countries. According to MOF, the amount of FDI attracted is even higher, at 33.6 billion USD. In 2024, Hai Phong achieved the 5th largest economic scale nationwide, with the highest economic growth rate and Industrial Production Index (IIP) among localities with a large economic scale. The city ranked 3rd in budget revenue and 2nd in FDI attraction in Vietnam. Its industrial parks (IPs) and economic zones (EZs) attracted 4.35 billion USD in foreign direct investment in 2024, nearly a 1.3-fold increase compared to 2023. This result played a crucial role in the gross regional domestic product (GRDP) growth of 11%. Notably, Hai Phong is the only locality in the country to maintain double-digit growth for 10 consecutive years, despite the impact of the COVID-19 pandemic and the severe Typhoon Yagi [1].

This paper sets out to examine the trends in FDI within Hai Phong's industrial parks over the period 2015 to 2024, paying particular attention to the intersecting roles of government policy, sustainability initiatives, and economic impact.

It is noted that the term "sustainable industrial park" is not defined in Vietnam and internationally, and sustainable industrial parks are not the focus of this paper. Nonetheless, this paper focuses on sustainability trends, such as the eco-industrial park model, industrial symbiosis and other emerging approaches and trends aimed at increasing their environmental, social and economic sustainability.

The Northern region of Vietnam, including Hai Phong, Hanoi, and Bac Ninh, has emerged as the country's most dynamic supply chain and industrial hub, hosting a significant share of Vietnam's manufacturing clusters due to its strategic location, access to deep-sea ports, and proximity to key trade corridors [2].

Among its industrial centers, Hai Phong's evolution into an "industrial powerhouse" is underpinned by three key factors. First is its geographic advantage: the city's deep-water port facilities, proximity to major shipping lanes, and its linkage to vital trade corridors have made it an attractive gateway for global investors [3]. Second, proactive government policies, ranging from tax incentives and streamlined administrative procedures, have effectively removed traditional barriers to investment [4]. Finally, a deliberate shift toward sustainable development, marked by the conversion of traditional industrial parks into eco-industrial parks (EIPs), signals Hai Phong's commitment to aligning with global environmental standards and circular economy models [5–7].

Hai Phong has defined the development orientation of EIPs as a key factor in maintaining its competitive advantages and attracting high-quality investment. Currently, Hai Phong has 18 established industrial parks (IPs), including 2 newly established EIPs, and 2 economic zones, of which 11 IPs are operational. Among these IPs, DEEP C IP, Nam Cau Kien IP and Nam Dinh Vu IP are currently in the process of transforming towards the international EIP model and have achieved impressive results so far: integrating advanced waste recycling and renewable energy technologies, implementing industrial symbiosis linkages in the metallurgy, plastics and plastic products manufacturing, and electrical equipment supporting industries.

For newly established industrial parks, the city has approved the construction planning of all areas to develop in a sustainable ecological direction, according to national

requirements. At the same time, Hai Phong is calling on investors to develop infrastructure and attract high-tech, modern, and environmentally friendly industries and fields that use resources sparingly and efficiently [1].

However, despite these promising developments, several challenges persist. Infrastructure gaps, rising labor costs, regulatory complexities in securing environmental permits, and the need for enhanced logistics mechanisms continue to pose obstacles to sustained growth.

This paper employs a mixed-methods approach to analyze the confluence of these factors, exploring both quantitative data and qualitative insights from key stakeholders including government officials, industrial park developers, international experts, and foreign investors.

In summary, the objectives of this study are to: i) Examine the trends of FDI and its economic impacts in Hai Phong's industrial parks over a decade; ii) Assess the role of government policies and international trade agreements, such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the EU-Vietnam Free Trade Agreement (EVFTA), in enhancing the city's investment attractiveness in advanced industrial parks; iii) Analyze sustainability initiatives, including the development of EIPs and their influence on shaping a competitive, green industrial environment; and iv) Identify the primary challenges facing the region and propose actionable policy recommendations aimed at ensuring long-term FDI growth and sustainable industrial development.

The following sections provide a detailed review of the extant literature, the methodological framework used, present results, and finally synthesize insights into practical recommendations for policymakers and industry leaders.

2. Literature Review

Several studies underscore the importance of targeted economic policies and industrial clustering in Vietnam, particularly in strategically located cities such as Hai Phong [3]. Researchers such as Nguyen et al. [8] and Cho et al. [9] have highlighted that Vietnam's transformation into an FDI magnet is driven by a comprehensive mix of fiscal incentives, streamlined administrative regulations, and bilateral as well as multilateral trade agreements. They further emphasizes the role of Vietnam's FDI inflows in global value chain participation and economic growth. Similarly, Tran et al. [10] argue that industrial parks provide an enabling environment by consolidating infrastructure, offering logistical advantages, and creating synergies among clustered enterprises. Kim et al. [11] provides insights into the volume and spatial patterns of FDI in Vietnam over three decades.

2.1. FDI Dynamics in the Regional Context

In the broader Southeast Asian region, the trends in attracting FDI have been shaped by global economic shifts, technological innovations, and evolving geopolitical considerations. Comparative analyses indicate that Vietnam's FDI inflow has grown significantly in the last decade, aided by policy reforms and increasing concerns for environmental sustainability. Northern Vietnam accounts for the majority of Vietnam's industrial cluster developments, particularly in high-tech sectors such as electronics and automotive components, which are increasingly concentrated around Hanoi and Hai Phong [2]. In particular, Hai Phong, with its distinctive blend of operational efficiencies and strategic positioning, mirrors these trends and often exceeds the performance of other regional economies in certain industrial sectors [3].

Building on these insights, recent research has increasingly incorporated sustainability as a key criterion for evaluating the attractiveness of FDI. The global emphasis on reducing carbon footprints and promoting a circular economy has pushed both governments and industries to adopt eco-friendly practices. Studies have shown that investors are now more likely to commit capital to projects that balance environmental stewardship with profitability [12].

2.2. Government Policies and Trade Agreements

Vietnam's integration into the global economy has been significantly bolstered by trade agreements such as the CPTPP and the EVFTA. Up to now, Vietnam has participated in 20 FTAs, of which 16 have taken effect and are being implemented. These agreements have opened expansive markets to Vietnamese exports, increasing investor confidence in the country's industrial capabilities. Numerous studies have linked such trade agreements with enhanced FDI inflows, noting that reduced tariff barriers and improved market access are potent drivers of foreign investment [4,13] discusses

the institutional changes brought about by new generation free trade agreements in Vietnam.

Moreover, domestic policy innovations, including corporate tax reductions, land lease facilitation, and streamlined customs procedures, have collectively boosted Hai Phong's appeal as an investment destination. The city's local administration has actively rolled out several strategies aimed at not only attracting but also sustaining foreign investments, thereby creating a competitive regulatory environment[4]. This policy framework has been particularly effective in drawing high-tech industries, which require fast, reliable administrative support and state-of-the-art infrastructure[14].

2.3. Sustainability, Eco-Industrial Parks, and Circular Economy Models

The transition to EIPs has emerged as one of the most transformative trends in industrial development. The literature indicates that EIPs do more than mitigate environmental harm; they create shared value by lowering operational costs, reducing waste, and ultimately facilitating a circular economy model. Negesa et al.[15] explore the transformation of traditional industrial parks into eco-industrial parks, using the case of Uganda. They provide methods for measuring circular economy efficiency in regional industrial sectors. Recent case studies in Hai Phong illustrate that the integration of renewable energy, waste recycling, and green building materials can lead to measurable positive impacts on both the environment and the economic bottom line[5,6].

For example, Deep C Industrial Zones have pioneered the use of recycled plastic to build roads, a practice that not only prevents landfill waste but also generates durable infrastructure that benefits the community. In parallel, investments in renewable energy projects within these industrial parks, such as rooftop solar panels and wind turbines, are setting ambitious targets for energy self-sufficiency (aiming for 50% renewable energy by 2030)[5]. Other industrial parks such as Nam Cau Kien have started introducing the concept of industrial symbiosis since their establishment. As of today, Nam Cau Kien has established 3 industrial symbiosis models for metallurgy, plastics and plastic products manufacturing, and electrical equipment. Nam Cau Kien is also in the process of forming and developing the industrial symbiosis of clean energy for its entire industrial park[16]. Another example is Nam Dinh Vu Industrial Park. This industrial park has already started the transition towards the EIP model by applying the EIP international framework in performance assessment, and by developing an action plan for its implementation[17]. Such dual-focused approaches, which combine economic growth with environmental responsibility, are critical for sustaining long-term industrial development in emerging economies[18] like Hai Phong.

2.4. Research Gaps and Contributions

While the current literature provides an overview of FDI trends and sustainability practices, notable gaps remain in the detailed assessment of how integrated policy measures and green initiatives interact to produce synergistic economic outcomes in specific geographic contexts such as Hai Phong. Most studies treat FDI as a monolithic phenomenon without disaggregating its impacts across diverse sectors or localities. This paper seeks to address these gaps by offering a granular analysis of Hai Phong's FDI trends, elucidating the role of government policies and sustainability strategies in fostering a vibrant, resilient industrial ecosystem.

By synthesizing insights from quantitative investment data, policy documents, and stakeholder interviews, this study contributes to a more nuanced understanding of how FDI can be leveraged to drive both economic prosperity and environmental sustainability. The subsequent sections will describe the methodological framework, present detailed findings, and discuss their implications for future industrial and policy strategies in Hai Phong.

3. Material and Methods

To comprehensively capture the dynamics of FDI in Hai Phong's industrial parks, this study adopts a mixed-methods research design that integrates quantitative analysis of investment trends with qualitative insights obtained from in-depth interviews and policy reviews, as well as from the authors' first-hand experience.

3.1. Data Collection

Quantitative Data:

Data on FDI inflows, industrial park investments, workforce statistics, and socioeconomic indicators were collected from publicly available sources such as the Vietnam Gen-

eral Statistics Office, Hai Phong Department of Statistics, and project-specific reports from key developments (e.g., GNP Nam Dinh Vu Industrial Property). Specific data points include:

- Total FDI capital for Hai Phong from the beginning to the end of 2024;
- Number of FDI projects and their sectoral distribution;
- Socioeconomic impacts such as workforce growth and income levels.

Qualitative Data:

Qualitative insights were obtained through structured interviews with a diverse range of stakeholders. In total, 18 interviews were conducted between March and June 2025. The interviewees included government officials (n = 5) involved in FDI and industrial park policy formulation, managers of major industrial parks (n = 4), representatives from international cooperation agencies (n = 3), and foreign investors (n = 6) from multinational corporations such as LG and Samsung, investment funds, as well as from Eurocham Vietnam. These interviews provided nuanced perspectives on policy effectiveness, regulatory challenges, and the operational impact of sustainability initiatives.

3.2. Data Analysis Techniques

The research incorporates both descriptive and inferential statistical analyses to assess the relationship between FDI trends and their economic outcomes. Time-series analyses were conducted to track the evolution of key investment indicators over the study period. Furthermore, qualitative data were analyzed using thematic coding. Transcripts were reviewed independently by two authors, and key themes were identified inductively, including policy effectiveness, sustainability practices, and investment challenges. Coding discrepancies were discussed and clarified until consensus was reached, ensuring reliability of the thematic analysis.

To ensure a robust integration of quantitative and qualitative data, the study followed a convergent parallel design. This method involves the simultaneous collection and analysis of both types of data, followed by a merging phase where findings are compared and contrasted. This approach facilitates triangulation, ensuring that the conclusions drawn are supported by multiple sources of evidence. In doing so, the study corroborates statistical trends with lived experiences and expert testimonies, thus enhancing the overall reliability and validity of the findings.

3.3. Visualization of Methodological Framework

Figure 1 is a Mermaid flowchart that summarizes the methodological framework adopted for this study.

3.4. Limitations

While the mixed-methods design provides a comprehensive framework for analysis, the study is not without limitations. Data availability for certain specific time periods and sectors may be incomplete, and inherent biases in qualitative interviews may affect the interpretation of stakeholder perspectives. Nonetheless, these limitations are mitigated by the triangulation of multiple data sources and the careful cross-verification of quantitative trends with qualitative findings.

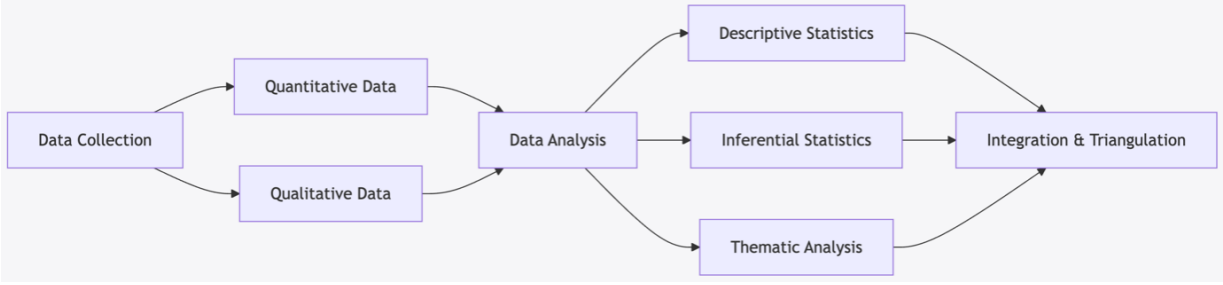

Figure 1. Research Methodology Framework.

4. Results and Discussion

This section presents the empirical findings of the study and discusses their implications for understanding the interplay between FDI, government policy, and sustainable industrial development in Hai Phong.

4.1. FDI Trends and Economic Impact

During the period from 2015 to 2024, Hai Phong has witnessed robust growth in FDI inflows. As already mentioned, recent statistics indicate that the city recorded an FDI capital inflow for over 1,000 projects, making it one of the foremost FDI destinations in Vietnam [1]. Hai Phong's attractiveness to foreign investors is reinforced by its integration into global production networks, where global value chains increasingly shape industrial location decisions and supplier development pathways [19]. A closer examination of the data reveals several notable trends:

To date, Hai Phong has steadily increased its foreign direct investment (FDI) projects attracting over 1,000 projects, with a cumulative capital of over 30 billion USD from 42 countries [13]. The majority of this FDI has been channeled into the city's industrial parks and economic zones. For instance, in just the first seven months of 2024.

Just in the first 7 months of 2024 alone, the city has attracted 1.4 billion USD in foreign investment capital. This includes 68 new projects with newly granted capital totaling more than 402 million USD. Specifically, 39 new projects in industrial parks and economic zones received over 350 million USD, accounting for 87% of the total [20].

The data also indicates a significant shift towards high-tech and advanced manufacturing sectors. Major investors such as LG (with investments exceeding 7.24 billion USD) have concentrated their capital in sectors like electronics, automotive components, and semiconductor materials [3]. In parallel, traditional sectors such as textiles and shipbuilding have experienced gradual modernization, driven by the adoption of innovative technologies.

The influx of FDI has led to tangible improvements in local socioeconomic conditions after 2020. For example, the workforce in industrial parks increased by 23.1%, while the average monthly income of residents saw a rise of 9.5% between 2020 and 2023. These improvements are attributable to the establishment of high-value manufacturing hubs and the creation of ancillary services and infrastructure [3].

Table 1 provides a comparative summary of key socioeconomic indicators before and after significant FDI inflows:

Table 1. Comparative Socioeconomic Outcomes in Hai Phong [3].

Indicator	2020	2023	Percentage Change
Workforce in Industrial Parks	158,000	194,485	+23.1%
Average Monthly Income (VND)	10.5M	11.5M	+9.5%
High-Tech Investment Share	42%	58%	+16%

This data highlights the transformative role of FDI in driving regional economic development and improving living standards. It further underscores the importance of strategic location, tailored policy measures, and a supportive industrial environment in attracting and sustaining foreign investments.

In the industrial parks (IPs) and economic zones (EZs) to date, according to the Hai Phong Industrial Zone Authority (HEZA), a cumulative total of over 1,000 FDI projects have been attracted, with an estimated total investment capital of USD 34 billion from large corporations alone, such as LG, SK, General Electric, Bridgestone and Pegatron. In 2024, the attraction of foreign direct investment reached USD 4.35 billion, equivalent to 242% of the year's target.

4.2. Policy Impacts and Government Incentives

Government policies have been at the forefront of making Hai Phong an attractive FDI destination, including in sustainable industrial parks. The local administration has adopted a comprehensive suite of policy measures aimed at reducing administrative hurdles and providing targeted fiscal incentives. Key policies that have contributed to this success include 3 main incentives: Tax Incentives and Land Lease Facilitation, Streamlined Customs and Regulatory Support, Promotion of Trade Agreements. Tax Incentives and Land Lease Facilitation helps corporate tax reductions and sim-

plified land lease procedures, which have lowered the entry barriers for investors, particularly in high-priority sectors such as electronics and automotive components [3]. For example, certain incentive packages offer tax rates as low as 10% for companies operating in priority industrial sectors. At the same time, the support for Streamlined Customs and Regulations which measures designed to expedite customs clearance and shorten environmental approval processes has significantly improved the efficiency of industrial operations. These initiatives are critical, given that regulatory complexity was identified as one of the key challenges affecting FDI uptake. Evidence from the EuroCham Business Climate Index (2024) confirms that nearly half of European businesses surveyed in Vietnam cited administrative and regulatory procedures as a significant barrier. While this survey does not provide disaggregated data specific to Hai Phong, several interviewed stakeholders (including EuroCham members operating in Hai Phong's DEEP C and Nam Dinh Vu industrial parks) reported that these challenges are particularly pronounced at the local level, especially in relation to environmental permitting and customs clearance.

Promotion of Trade Agreements to implement effectively the CPTPP and the EVFTA has expanded market access for Vietnamese exports, thereby enhancing the overall attractiveness of the investment climate. These trade agreements have played a pivotal role in integrating Vietnam into global supply chains and reducing trade barriers for high-tech products [4].

The impact of these policies is further illustrated by the performance of flagship projects such as GNP Nam Dinh Vu industrial hub. This industrial property, developed with a focus on efficient logistics and modern infrastructure, has become a magnet for both domestic and international investors, effectively demonstrating how coordinated policy interventions can translate into substantial economic gains.

4.3. Sustainability and the Rise of Eco-Industrial Parks

Hai Phong is a major industrial hub with 18 industrial parks (with a total area of about 7,378 hectares) and 02 economic zones (with a total area of about 42,540 hectares). 11 parks are already operational, with an average occupancy rate exceeding 70%. IPs and EZs in Hai Phong have attracted a cumulative total of 32.2 billion USD in FDI across 1,000 projects by the end of October 2024, ranking 6th nationwide [21]. However, rapid industrial development also poses significant challenges regarding the environment, governance, and society. Air pollution is becoming a serious concern in industrial zones across the city. The rate of exceeding standards at monitoring points, especially those directly affected by industrial activities, has increased from 2.3% in 2022 to 6.1% in 2023 and continued to rise to 10.3% in 2024. Regarding wastewater, although industrial parks in Hai Phong all have centralized wastewater treatment plants, according to the Hai Phong City People's Committee's 2024 environmental protection report, water pollution tends to increase, with indicators such as TSS, COD, Coliform, BOD5, etc., threatening the city's freshwater resources. Another noteworthy issue is that most industrial parks in Hai Phong have not yet implemented wastewater reuse solutions. Treated wastewater is mainly discharged directly into receiving water bodies, leading to a waste of water resources and increasing the risk of environmental pollution.

The management of solid waste and hazardous waste also presents a significant challenge for industrial parks in Hai Phong. Currently, industrial parks in the city are not equipped with solid waste and hazardous waste transfer stations, which complicates the effective collection, sorting, and treatment processes.

Electricity plays a pivotal role in production activities within industrial parks. However, the increasing electricity consumption poses significant challenges for ensuring a stable power supply and protecting the environment. Statistics show that electricity consumption in Hai Phong's industrial parks reached 2,386 GWh in 2023 and increased by 15.8% in 2024, reflecting the expanding scale of production of businesses within the industrial parks [1].

Industrial parks, while acting as drivers of economic growth and also being significant sources of emissions and resource consumption, are undergoing a green transition to minimize their environmental impact and ensure sustainable development.

A major emerging trend in Hai Phong's industrial landscape is the adoption of sustainability-driven strategies. Building green industrial zones creates momentum for sustainable development [21]. Rising environmental concerns and global initiatives to reduce carbon emissions have pushed the region towards the development of EIPs. The transforma-

tion efforts are geared toward promoting a circular economy, conserving resources, and reducing waste.

So far, Hai Phong is leading the way with several key sustainability initiatives which have been implemented in some industrial parks. Deep C is piloting green infrastructure projects, such as constructing roads from recycled plastic waste. This innovative approach has successfully diverted nearly 4 tonnes of flexible packaging from landfills for every kilometer of road built, which not only helps reduce pollution but also improves the durability and cost-efficiency of the infrastructure.

Furthermore, eco-industrial parks in Hai Phong are increasingly adopting renewable energy solutions. These parks have set ambitious goals to supply up to 50% of their energy needs with solar and wind power by 2030, aligning with national and international environmental standards. They're also installing smart electricity grids to optimize energy consumption and lower operational costs.

The trend of reusing treated wastewater is on the rise when Hai Phong's industrial parks have significant potential to reuse treated wastewater for non-domestic purposes such as industrial cooling, watering trees, cleaning roads and factories, and firefighting, as outlined in Article 49 of the Law on Raw Water. Furthermore, several industrial parks have achieved Leadership in Energy and Environmental Design (LEED) certification for their building projects. This certification demonstrates a commitment to high environmental performance standards, which in turn enhances the credibility of these industrial parks among investors who focus on environmental, social, and governance (ESG) factors.

The green transition is inevitable for all IPs in Hai Phong, as they aim toward sustainable development. The green transition of Hai Phong's industrial parks will be integrated with digital transformation. These two processes are complementary, creating a strong impetus for promoting innovation and green growth.

For newly established industrial parks, the city has approved the construction planning of all areas to develop in a sustainable ecological direction, with targets for green spaces, public transportation, etc. At the same time, it is calling on investors to develop infrastructure and attract high-tech, modern, and environmentally friendly industries and fields that use resources sparingly and efficiently. Details on the process to be followed and on how this differs from conventional industrial park authorization process have been clarified by UNIDO[22], while the requirements for new EIP have been set out by the Vietnamese Government in Decree No. 35/2022/NĐ-CP[23] and Circular No. 05/2025/TT-BKHDT[24].

The following schematic diagram (**Figure 2**) summarizes the key components of the sustainable industrial park model in Hai Phong.

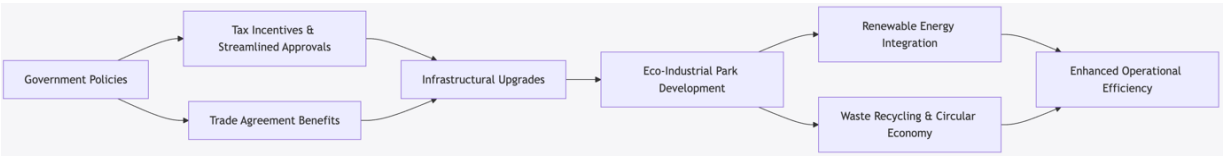

Figure 2. Integrated Sustainability Framework in Hai Phong's Industrial Parks.

Shinetsu Example:

Individual companies can benefit significantly from industrial synergies and from resource efficiency and cleaner production (RECP) practices implemented in EIPs. For example, Shin-Etsu Magnetic Materials Vietnam Co., located in Deep C Industrial Park, participated in the UNIDO "Eco-Industrial Parks Intervention in Vietnam" gaining significant economic and environmental benefits[25]. According to the intervention summary, published by UNIDO on their project website (https://eip-vietnam.org/), interventions included training in RECP, identification and implementation of technical solutions for an investment of around USD 2 million over 3 years. This resulted in substantial electricity and water savings, along with significant reductions in CO_2 emissions, leading to considerable financial savings for the company. For example, Factory 2 implemented solutions that saved 186,940 kWh of power and 39,420 cubic meters of water annually, while also reducing CO_2 emissions by 150 tons each year. Meanwhile, Factory 1 saw even greater results, saving 469 MWh of power, 722 m^3 of water, and 16.56 tons of LPG fuel per year. These changes led to an impressive reduction of 1,887 tons of CO_2 annually and resulted in 1.6 billion

VND (or approximately USD 68,500) in yearly financial savings from nine separate solutions. These sustainability initiatives are pivotal in not only minimizing environmental footprints but also in catalyzing economic benefits.

4.4. Challenges and Emerging Dynamics

Despite the impressive strides made in attracting FDI and promoting sustainability, several challenges remain that could potentially hinder the long-term growth of Hai Phong's industrial ecosystem.

While Hai Phong's industrial ecosystem is bolstered by strong infrastructure, some industrial parks still face significant infrastructure gaps. Despite substantial investments in modernizing transport and logistics, certain zones still lack the high-quality infrastructure needed for optimal growth. For instance, only about 31% of industrial parks currently meet top-tier logistics quality standards, which could constrain further investment, especially in high-tech sectors. In particular, the integration of renewable energy sources such as solar and wind power into the power grid still faces many difficulties due to a lack of supportive mechanisms and suitable transmission systems. Wastewater reuse in industrial park also needs ancillary investments such as advanced treatment technology, separate pipes to freshwater system, water quality controlling and monitoring tools.

Labor Market is facing constraints between the demand for skilled labor and available human resources because of rising wages and a shifting skill set driven by automation. The annual compound growth rate (CAGR) of labor costs has risen steadily, adding pressure on both new and existing enterprises to optimize operations [3].

Regulatory clarity and streamlined approval processes are crucial for attracting investors to industrial parks. While policy reforms have reduced many bureaucratic hurdles, regulatory complexity persists, as the process of obtaining environmental clearances and other approvals remains cumbersome and time-consuming. This delay can deter potential investors who require quick operational setups. A lack of policy synchronization is also a significant obstacle. Policies regarding the green transition to attract FDI are not yet comprehensive, lack coherence, and have limited enforcement effectiveness. This creates difficulties for businesses in accessing supporting capital, tax incentives, and other promotional policies.

Environmental factors need to be taken into account. Since Hai Phong continues to pioneer green initiatives, balancing rapid industrial growth with robust environmental safeguards remains a persistent challenge. The need to upgrade existing facilities to comply with global standards necessitates ongoing investments that could strain local budgets. This balancing act requires strategic planning to ensure that industrial expansion does not come at the cost of the environment.

These challenges underscore the importance of an adaptive and proactive policy framework that evolves continuously to address emerging issues, and highlight the need for targeted investments in infrastructure and human capital to support the sustained attraction of high-value FDI. The following section builds directly on these findings by outlining policy recommendations tailored to industrial parks in Hai Phong, for example, addressing infrastructure and utilities gaps within parks, improving the regulatory environment for environmental permitting and land leasing, expanding training programs for the IP workforce, and scaling up eco-industrial park models to balance growth with sustainability.

5. Conclusions

5.1. Key Findings

This paper provides an analysis of FDI trends in Hai Phong's industrial parks over the past decade, highlighting the multifaceted influence of government policies, sustainability initiatives, and economic dynamics. Key findings include:

The key findings reveal a robust FDI growth, with Hai Phong attracting over 1,000 FDI projects with cumulative capital exceeding 30 billion USD, indicating strong investor confidence driven by strategic location and efficient policy support. The majority of FDI investments are channeled to industrial parks and economic zones.

A significant economic upswing has been triggered by the influx of foreign investment, which has significantly transformed local socio-economic indicators, including workforce expansion (a 23.1% increase) and a notable rise in average monthly income (+9.5%) [3]. High-tech investments have surged, contributing to improved productivity and competitiveness. As highlighted by Schröder (2017) [19] linking local firms to foreign investors through structured supplier devel-

opment programs is critical for leveraging FDI to achieve sustainable industrial upgrading in regions such as Hai Phong.

The city's attractiveness is further enhanced by comprehensive policy measures, including tax incentives, streamlined customs procedures, and the leveraging of key trade agreements (CPTPP, EVFTA), which have been critical factors in enhancing Hai Phong's FDI attractiveness [4].

Significant advancement has been made in sustainability, especially through the proactive transformation of traditional industrial parks into eco-industrial parks which underscores a strategic shift towards sustainable development. Initiatives such as renewable energy integration and innovative recycling projects have positioned Hai Phong as a leader in eco-friendly industrialization [5].

5.2. Policy Recommendations

Building on the discussion of key findings and challenges in Hai Phong's industrial parks, this section translates them into actionable policy recommendations. For instance, the infrastructure bottlenecks identified in Section 4.4 point to the need for improved logistics and energy systems within IPs; labor market constraints require new vocational training and partnerships between park developers and educational institutions; regulatory hurdles, especially for environmental permits, call for streamlined 'one-stop-shop' services at the IP level; and environmental pressures highlight the importance of accelerating eco-industrial park transformations and resource efficiency measures.

First, infrastructure development needs to be a priority. This includes upgrading transport networks and logistics facilities to meet top-tier standards, and accelerating the creation of smart industrial zones with digital solutions for monitoring and resource allocation. Plans should be designed for multi-modal transport and for appropriately arranging urban and industrial spaces. Furthermore, infrastructure should be improved to support the uptake of renewable energy through upgrades to the electric grid, smart grid integration, and the use of IoT, AI, and battery storage for energy management.

Second, regulatory processes should be revised and streamlined. Adopting digital systems can help to further shorten the timeline for environmental and customs clearances. A one-stop-shop model would also be beneficial for investors, making it easier to handle regulatory, financial, and administrative processes. Additionally, policies should allow for the reuse of treated wastewater within industrial parks and by their tenants, with clear quality standards for specific purposes like watering trees or industrial cooling.

Third, workforce development is crucial. This can be achieved by establishing training centers in partnership with industry leaders to bridge the skill gap in high-tech sectors. Public-private partnerships should also be encouraged to drive vocational education and continuous professional development programs tailored to emerging technologies.

Fourth, sustainability initiatives need to be bolstered. Increased funding and incentives for developing eco-industrial parks are essential, especially for projects that integrate renewable energy and circular economy practices. Facilitating research and development collaborations among local universities, research institutions, and industry players is also key to innovating green technologies and sustainable production methods.

Fifth, international trade relations should be strengthened. Leveraging existing trade agreements can help open up new markets and secure preferential trade terms for high-value exports. The city should also be promoted as a leading hub for sustainable industrial development at international forums and trade exhibitions.

Finally, there should be a strong focus on selecting and promoting green investment. This requires a shift in mindset from prioritizing quantity to quality. Projects that use advanced, environmentally friendly technology and modern management processes should be prioritized. Investment promotion activities should also be developed to connect supply and demand and advertise green businesses, all while adhering to international trends in ESG and greenhouse gas emission reduction targets.

5.3. Concluding Remarks

Hai Phong stands at a critical juncture where the convergence of strategic policy frameworks, infrastructural improvements, and sustainability imperatives is creating a robust platform for continued FDI growth. The transformative potentials evident in eco-industrial parks and high-tech clusters underscore that with the right mix of regulatory support and technological innovation, emerging cities can be powerful engines of both economic growth and green development.

In conclusion, the findings of this study not only affirm

Hai Phong's status as a dynamic investment destination but also highlight the multifaceted approach that policymakers must adopt to harness the full benefits of FDI. Addressing current challenges and scaling up best practices will be essential to maintain competitive advantage and set a replicable model for other emerging economies.

Table 2 encapsulates the main findings and recommendations of this study:

Table 2. Summary of Findings and Recommendations.

Key Aspect	Findings	Policy Recommendation
FDI Growth	Over 1,000 projects; >28 billion USD capital	Enhance infrastructure and digital approval systems
Economic Impact	+23.1% workforce growth; +9.5% income increase	Boost workforce development through targeted training
Policy Environment	Strong tax and regulatory incentives	Streamline regulatory processes and create one-stop services
Sustainability Initiatives	Eco-industrial parks with RECP and industrial symbiosis	Increase R&D collaborations; scale up EIP initiatives
Trade Agreements and Market Access	CPTPP and EVFTA bolstering export capacity	Leverage international partnerships in global trade forums

The analysis presented in this paper underscores the critical role that integrated policy measures and sustainability initiatives play in shaping the trajectory of foreign investments in Hai Phong. With continued emphasis on infrastructural enhancements, regulatory reforms, and workforce development, the city is well-poised to sustain its momentum as a leading FDI hub in Vietnam. As global economic paradigms increasingly favor green and resilient models of growth, Hai Phong's experience offers a valuable blueprint for emerging economies striving for balanced, sustainable development.

Through this study, we reinforce the notion that government policies, when aligned with market dynamics and sustainability priorities, can yield transformative economic outcomes that extend far beyond traditional growth metrics. The lessons from Hai Phong's evolving industrial landscape are not only applicable to other regions within Vietnam but also offer strategic insights for global policymakers aiming to foster integrated, sustainable industrial development.

Author Contributions

A.F. conceptualized the paper; A.F., T.A.N. and T.T.N. undertook formal analysis, investigation and defined the methodology; A.F. wrote the original draft; N.H.B. and V.V.N. validated the data; G.D., A.P.H., V.V.N. and A.F. reviewed the paper towards its finalization. All authors have read and agreed to the published version of the manuscript.

Funding

The research received no funding support.

Institutional Review Board Statement

Ethical review and approval were waived for this study since it did not involve human or animal experiments, nor the collection of personal or sensitive data. All interviews conducted with stakeholders were voluntary and limited to professional insights related to investment and industrial development policies.

Informed Consent Statement

Not applicable.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare no conflict of interests. The view expressed in this paper reflects those of the single authors, and not the official view of the organizations they work for.

References

[1] Bui, N.H., 2025. Green transformation in industrial parks and economic zones in Hai Phong. In Proceedings of the Conference on Green Transformation in Industrial Parks toward Sustainable Development of Hai Phong City. Cat Hai, Vietnam, 31 March 2025.

[2] Vietnam Briefing, 2025. Spotlight on Four of Vietnam's Supply Chain Clusters. Available from: https://www.vietnam-briefing.com/doing-business-guide/vietnam/sector-insights/spotlight-on-four-of-vietnam-s-supply-chain-clusters (cited 23 June 2025).

[3] Viettonkin Consulting, 2024. Hai Phong's FDI Landscape: A Comprehensive View. Viettonkin Consulting: Hanoi, Vietnam.

[4] Hai Phong City, 2024. Investment. Available from: https://en.haiphong.gov.vn/investment/ (cited 23 June 2025).

[5] Deep C, 2024. Sustainability. DEEP C Industrial Zones: Haiphong, Vietnam.

[6] Vietnam Business Forum, 2020. Eco-industrial park is future of industry. Available from: https://vccinews.com/news/40948/eco-industrial-park-is-future-of-industry.html (cited 2 May 2025).

[7] VOV, 2024. Vietnam develops eco-industrial zones to attract foreign investors. Voice of Vietnam: Hanoi, Vietnam. (in Vietnamese)

[8] Nguyen, T.T., Pham, Q.T., Do, T.T., et al., 2021. Foreign direct investment and income inequality in Southeast Asian countries: New evidence from panel data analysis. PSU Journal of Social Sciences and Humanities. 28(2), 215–232. Available from: https://so05.tci-thaijo.org/index.php/psujssh/article/view/264057.

[9] Cho, J., Hinojales, M.M., Hong, S.H., et al., 2021. The Role of Vietnam's FDI Inflows in Global Value Chains Participation and Economic Growth, Working Paper(WP21/-02). ASEAN+3 Macroeconomic Research Office (AMRO): Singapore.

[10] Tran, P., Le, K., 2020. Industrial Parks and Economic Growth in Vietnam: A Policy Perspective. International Journal of Innovation, Creativity and Change. 13(10), 692–700. Available from: https://www.ijicc.net/images/vol_13/Iss_10/131063_Ngan_2020_E_R1.pdf.

[11] Kim, H.M., 2024. Foreign direct investment and urban growth in Vietnam: spatial, economic, and demographic perspectives. Asian Geographer. 41(2), 167–184. DOI: https://doi.org/10.1080/10225706.2023.2244946.

[12] Diep, N.T.N., Yen, V.T.H., 2024. Research on factors affecting green financial development in Vietnam. Health, Science and Technology—Conference Series. 3. DOI: https://doi.org/10.56294/sctconf2024.1259.

[13] Hai Phong Economic Zone Authority (HEZA), 2025. Hai Phong has more than 3.5 billion USD in additional DDI and FDI capital. Available from: https://baodautu.vn/hai-phong-co-them-hon-35-ty-usd-von-dau-tu-ddi-va-fdi-d241127.html (cited 23 June 2025). (in Vietnamese)

[14] Boguszewski, M., 2022. New Generation Free Trade Agreements and Institutional Change: The Case of Vietnam. Stosunki Międzynarodowe—International Relations. 58, 42–68.

[15] Negesa, D., Geme, T., Nijman-Ross, E., et al., 2023. Eco-industrial transformation in Uganda: performance evaluation of industrial parks using the international EIP framework. Frontiers in Sustainability. 4, 1286611. DOI: https://doi.org/10.3389/frsus.2023.1286611.

[16] Pham. H.D., 2024. Nam Cau Kien Industrial Park, Transition Pathway to Eco-Industrial Park towards Neutral Carbon. Available from: https://eip-vietnam.org/static/pdf/12_WS_15%20Sept%202022_Decree%2035_Presentation_Nam%20Cau%20Kien_Mr%20Diep_EN.pdf (cited 14 June 2025).

[17] Vietnam Investment Review, 2024. Sao Do Group develops eco-industrial parks linked with green growth. Available from: https://baodautu.vn/tap-doan-sao-do-phat-trien-khu-cong-nghiep-sinh-thai-gan-voi-tang-truong-xanh-d212749.html (cited 14 June 2025). (in Vietnamese)

[18] Wang, X., Ding, H., Liu, L., 2019. Eco-efficiency measurement of industrial sectors in China: A hybrid super-efficiency DEA analysis. Journal of Cleaner Production. 229, 53–64. DOI: https://doi.org/10.1016/j.jclepro.2019.05.014.

[19] Schröder, M., 2017. Viet Nam's Automotive Supplier Industry: Development Prospects under Conditions of Free Trade and Global Production Networks. Available from: https://www.eria.org/ERIA-DP-2017-05.pdf (cited 2 May 2025).

[20] The Government of Hai Phong City, 2024. Hai Phong City Leads in FDI Attraction. Available from: https://en.haiphong.gov.vn/investment/hai-phong-city-leads-in-fdi-attraction-704437 (cited 2 May 2025).

[21] Hai Phong Economic Zone Authority (HEZA), 2024. Building Green Industrial Zones Creates Momentum for Sustainable Development. HEZA: Hai Phong, Vietnam.

[22] Pham, T., van Beers, D., Flammini, A., et al., 2023. Guidelines for establishing new eco-industrial parks in Viet Nam for developers and provincial authorities. Available from: https://eip-vietnam.org/static/Guidelines%20for%20establishing%20new%20Eco-industrial%20parks%20in%20Vietnam%20for%20developers%20and%20provincial%20authorities.pdf (cited 2 May 2025).

[23] Government of Vietnam, 2022. Regulations on Management of Industrial Park and Economic Zones. Decree 35/2022/ND-CP, 28 May 2022. Available from: https://thuvienphapluat.vn/van-ban/Thuong-mai/Nghi-dinh-35-2022-ND-CP-quan-ly-khu-cong-nghiep-kinh-te-482305.aspx (cited 23 June 2025). (in

Vietnamese)

[24] Ministry of Planning and Investment, 2025. Guidance on Eco-Industrial Park Development. Available from: https://datafiles.chinhphu.vn/cpp/files/vbpq/2025/3/05-bkhdt.pdf (cited 23 June 2025). (in Vietnamese)

[25] UNIDO, 2024. Eco-Industrial Parks Intervention in Vietnam.