

ATTRACTING FOREIGN DIRECT INVESTMENT FOR DEVELOPMENT ECO-INDUSTRIAL PARK MODEL IN THE RED RIVER DELTA

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Abstract. This research proposes strategic solutions for attracting Foreign Direct Investment (FDI) to develop eco-industrial parks in the Red River Delta region through 2030, with a vision for 2050. The author's proposed solutions are grounded in a comprehensive analysis of the current status and developmental trends of eco-industrial park models, forecasted impacts of international and domestic contexts on FDI flows, and the competitive advantages of the Red River Delta region in attracting FDI specifically for eco-industrial parks. Regarding the development plan, the research focuses on proposing spatial distribution strategies across two sub-regions, the optimal number of industrial parks, and parks as well as the orientation to attract key industries in eco-industrial parks. To enhance FDI attraction effectiveness for eco-industrial park development, the author proposes concentrated implementation of solutions in three critical areas: infrastructure modernization, specialized development support policies, and regional linkages in promoting foreign direct investment.

Keywords: foreign direct investment, eco-industrial park, the Red River Delta.

1. Introduction

An eco-industrial park is an industrial zone where enterprises participate in cleaner production, use resources efficiently, and collaborate to carry out industrial symbiosis activities, all following criteria specified in the relevant decree [1]. Specifically, Decree No. 35/2022/ND-CP, issued by the Government, regulates the management of industrial parks and economic zones. It defines criteria concerning the activities of primary investors (those responsible for building and managing industrial park infrastructure) and secondary investors (those engaged in production and business operations within industrial parks). The decree also mandates a minimum of 25% of the park area to be allocated to green spaces, transportation, technical zones, and shared social infrastructure, as well as other facilities (housing, service structures, etc.).

In Vietnam, research on eco-industrial parks remains limited, focusing mostly on the concept of eco-industrial parks and experiences with this model in other countries. For instance, Nguyen Cao Lanh (2005) proposed eco-industrial parks as a model for sustainable development in Vietnam [2]. Additionally, Do Dieu Huong et. al summarized key theoretical and practical insights on eco-industrial park development worldwide and assessed the feasibility of implementing this model in Thang Long II Industrial Park, Hung Yen Province [3]. On the topic of the attraction of foreign direct investment into Vietnamese industrial parks, many studies have suggested strategies for attracting FDI at the provincial level, such as Pham Van Cuong's research

on Thai Binh province [4] and Nguyen Dinh Tung's study on Quang Ninh province [5]. At a number of workshops organized by the Ministry of Planning and Investment on this topic recently, managers have assessed some of the main advantages and disadvantages of developing the eco-industrial park model and mentioned the direction of attracting high-quality FDI capital flows. However, the content has only stopped at the level of general comments and there has not been any in-depth research on this topic. The Red River Delta region, with its abundant human resources and infrastructure, is well-positioned to pioneer the development of eco-industrial park models. This development responds to increasing pressures from population growth, urbanization, environmental concerns, and the shift toward green growth—especially as Vietnam has committed to achieving net-zero emissions by 2050. To support the development of eco-industrial parks, FDI is crucial, given the limitations in Vietnam's financial and technological resources key factors in advancing eco-industrial parks. However, no research to date has specifically examined strategies for attracting FDI to develop eco-industrial park models in the Red River Delta.

This paper proposes strategies to attract FDI to support the development of eco-industrial park models in the Red River Delta, with a target timeline extending to 2030 and a vision for 2050. This proposal is based on an in-depth examination of three key areas: (i) the theoretical foundations regarding the role of FDI in the development of eco-industrial park models; (ii) the current state of eco-industrial park development in the Red River Delta; and (iii) the contextual factors and strategic directions for promoting eco-industrial parks, including FDI attraction efforts within this region.

2. Content

2.1. Database and research methods

In this study, the main data used by the author are based on a Report on the development of industrial parks and economic zones in 2023; a Report on the Red River Delta Regional Planning for the period 2021-2030, with a vision to 2050. In addition, during the research process, the author conducted field surveys in Hai Phong city and Hung Yen province to collect information on the current status of the development of ecological industrial park models in these two provinces.

The main methods used include (i) Synthesis of related documents; (ii) Statistical analysis; (iii) Economic forecasting and (iv) Field survey.

2.2. The Role of Foreign Direct Investment in Developing Eco-Industrial Park Models

2.2.1. Foreign direct investment as a critical source of capital for eco-industrial park development, enhancing budget revenues and promoting local economic restructuring toward green growth

According to Solow's (1956) growth theory, economic growth is driven by factors such as capital accumulation and labor. In this framework, FDI provides essential capital to the host country, stimulating economic growth and moving the economy toward a new stable state through increased capital accumulation. In recent years, the development of industrial parks in Vietnam has demonstrated the significant role of FDI, which by the end of 2023 accounted for the majority of both projects (10,828 projects compared to 9,160 domestic projects) and capital invested (with implemented FDI capital reaching \$132.7 billion compared to approximately \$30-32 billion in domestic capital).

The financial contributions of FDI projects increase local budget revenues, thus expanding the potential for reinvestment and enabling the introduction of supportive policies to “seed” eco-industrial park models within localities. Furthermore, FDI inflows contribute to the development

of environmentally friendly industries, such as electronics and electric vehicle manufacturing, aligning with the standards and goals of eco-industrial parks.

2.2.2 Foreign direct investment as a driver for the diffusion of modern, environmentally friendly technologies, promoting the development of eco-industrial parks

FDI contributes to economic growth by facilitating the diffusion of technology, labor mobility, management skills training, and organizational restructuring (Romer, 1990; Barro and Sala-I-Martin, 1995; De Jager, 2004). This foreign investment enhances the productivity of the host country's economy and serves as a catalyst for domestic investment and technological advancement. The spillover effects of FDI are generally observed through five main channels: (i) imitation, (ii) labor mobility, (iii) trade, (iv) competition, and (v) production linkages. Attracting FDI, particularly from major corporations with advanced technologies, can drive the development of eco-industrial parks in two key ways: (i) facilitating the spread of modern, eco-friendly technologies that align with Vietnam's current eco-industrial park standards, which require at least 20% of enterprises to implement solutions for resource efficiency and cleaner production, achieving reductions in raw materials, water, energy, chemicals, waste, and emissions; and (ii) establishing a core component of the industrial symbiosis network, thereby enhancing the efficiency of resource utilization and reducing emissions.

2.2.3. Foreign direct investment as a catalyst for institutional reform and improvement of local investment and business environments

Many countries, including Vietnam, have intensified efforts to improve the investment and business environment, simplify administrative procedures, and enhance institutional frameworks to attract FDI, especially from large multinational corporations. Additionally, as nations integrate more deeply into global value chains, they must adapt to meet international standards and practices. This drive for institutional alignment serves as a foundation for improving the legal framework, regulations, and investment policies, specifically for the development of eco-industrial parks.

2.3. Current status of attracting foreign direct investment for industrial park development

In recent years, Vietnam's policy to promote eco-industrial park models, including those in the Red River Delta, has been evidenced by various legal documents and specific initiatives. However, the implementation of this policy has faced significant challenges from both the Government and enterprises. On the Government's side, there are regulatory gaps in industrial park planning standards and industrial symbiosis criteria, as well as insufficient support policies. Enterprises, meanwhile, demonstrate limited engagement and face constraints in financial resources and technological capabilities. Consequently, no industrial park in the Red River Delta has yet obtained certification as an eco-industrial park. The following analysis assesses the current status of FDI attraction for the general development of industrial park models in the Red River Delta.

By the end of 2023, the Red River Delta ranks as the second-largest region for active industrial parks in Vietnam, following the Southeast region. FDI plays a crucial role in the development of the industrial park model in this region, as illustrated by the following key indicators:

(i) **Leased industrial land area:** FDI enterprises in the Red River Delta have leased 5,352 hectares of land, accounting for 39.2% of the total leased industrial land area in the region's industrial parks and 28.8% of the total industrial land leased by FDI enterprises nationwide.

(ii) **FDI capital in secondary projects implemented (cumulative calculation):** FDI enterprises have implemented 3,351 projects with a total capital of USD 39.81 billion in the

region's industrial parks, representing 30.1% of the total FDI capital in industrial parks across the country. The average investment per project (based on implemented capital) is USD 11.9 million, and per hectare is USD 7.44 million—both higher than the national average and that of the domestic sector.

(iii) **Revenue of FDI enterprises in industrial parks (cumulative calculation):** Revenue from FDI enterprises in the Red River Delta's industrial parks is estimated at USD 96.77 billion, accounting for 40.9% of the national total.

(iv) **Employment in the FDI sector within industrial parks:** FDI enterprises in the region's industrial parks employ approximately 560,852 workers, representing 82.7% of the total workforce in the region's industrial parks and 20.3% of the FDI sector's workforce in industrial parks nationwide.

(v) **Budget contributions:** FDI enterprises in industrial parks in the Red River Delta have contributed a cumulative VND 28.45 trillion to the national budget, accounting for 69.3% of the total budget contributions from industrial parks in the region and 32.1% of the total contributions from FDI enterprises in industrial parks nationwide.

Table 1. Investment attraction situation and performance of foreign-invested sectors in regional industrial parks in the Red River Delta region as of the end of December 2023

Indicators	Red River Delta	Other regions	Nationwide
Number of operating industrial parks	78	222	300
Industrial land area leased to FDI enterprises (ha)	5.352	13.245	18.597
FDI capital in secondary projects implemented (million USD)	39.810	92.433	132.243
FDI enterprise revenue (million USD)	96.771	139.620	236.391
Number of employees in the FDI sector (people)	560.852	2.201.540	2.762.392
Budget contribution of the FDI sector (billion VND)	28.450	60.060	88.510

Source: Author's collection from [6]

2.4. Prospects and orientations for attracting foreign direct investment for developing the model of eco-industrial parks in the Red River Delta

2.4.1. Prospects

The Red River Delta region presents promising prospects for attracting foreign direct investment (FDI) to develop eco-industrial parks from now until 2030, with a vision extending to 2050. These prospects can be outlined as follows:

First, the Red River Delta offers a range of competitive advantages in attracting FDI in general, as well as high-quality, large-scale FDI flows characterized by advanced, environmentally friendly technology. These advantages underpin the potential for developing eco-industrial parks. Specifically: (i) The region's infrastructure is relatively complete, well-integrated, and undergoing modernization, particularly in terms of highways, seaports, and airports that facilitate fast and convenient connections to international markets; (ii) It is home to a concentration of high-quality human resources, especially in major urban centers like Hanoi and Hai Phong cities; (iii) The land reserve for industrial park development, including the eco-industrial park model, remains substantial. By 2030, the Red River Delta is expected to host 209 industrial parks, a significant increase from the current 119 established and 78 operational parks,

covering a projected area of 51,957 hectares—more than double the current area [8]; (iv) The region holds a crucial geo-economic position as one of the nation's two primary growth engines, serving as a gateway to the East Sea and a bridge between the dynamic regions of Southeast Asia and East Asia, particularly the Chinese market. Additionally, it is the location of the capital, Hanoi, and numerous World Heritage sites, all of which add to its appeal to FDI investors.

Second, the trend toward green economic development, including the eco-industrial park model, is expected to accelerate. This is due to: (i) Institutional support, as Vietnam has enacted the National Strategy on Green Growth for 2021–2030 with a vision for 2050 [7], along with incentive and preferential policies for eco-industrial parks outlined in Decree No. 35/2022/ND-CP [1]. These measures align with Vietnam's broader commitment to achieving net-zero emissions by 2050; (ii) The large population in the Red River Delta places significant pressure on resources and environmental quality, not only in urban areas but also in rural areas where industrial parks are primarily situated. As a result, developing eco-industrial parks to enhance resource efficiency and reduce pollutant emissions is considered an effective approach for ensuring a sustainable environment in this high-density region.

2.4.2. Challenges

Attracting foreign direct investment to develop the eco-industrial park model in the Red River Delta in the coming period faces the following main challenges:

First, competition in attracting investment from other industrial park models, especially the traditional industrial park model that is currently popular in the Red River Delta. In the context that the requirements for projects in eco-industrial parks are often stricter than other types of industrial parks (requiring higher environmental standards, creating industrial symbiosis), the general trend of both FDI investors and receiving localities is to prioritize choosing the traditional industrial park model to implement projects.

Second, competition in attracting investment from other regions in Vietnam. Developing the eco-industrial park model is a common policy of the whole country, so the remaining regions are also interested in developing this model and also set the goal of attracting foreign direct investment into eco-industrial parks. In that context, the Red River Delta will have to compete with regions such as the Southeast (where infrastructure and human resources are competitive), the Northern Midlands and Mountains, and the North Central and Central Coast (where land rental costs and labor are competitive).

2.4.3. Orientation

a) For the development of eco-industrial parks

Developing the eco-industrial park model can be implemented in 02 ways: (i) Clearly specify in the dossier, approval decision and implementation from the step of establishing construction planning and orienting industries and occupations to attract investment; (ii) Converting from existing industrial park forms to eco-industrial parks. Accordingly, the development direction of the eco-industrial park model in the Red River Delta is proposed as follows:

(i) Piloting new planning of 3-5 eco-industrial parks in the Red River Delta, prioritizing industrial parks expected to be located on the Hanoi - Hai Phong economic corridor to (i) maximize the advantages in transport connection and labor resources; (ii) increasing the opportunity for industrial symbiosis to spread to existing production activities on this economic corridor. In these pilot eco-industrial parks, the planning and construction, attracting investment in infrastructure as well as development investment must comply with the standards for eco-industrial parks on the basis of enjoying special preferential policies on investment procedures and finance.

(ii) Converting a number of existing industrial parks that ensure the necessary conditions for reserve land funds and nuclear industrial enterprises in the group of environmentally friendly

production industries into the eco-industrial park model. For this orientation, priority should be given to industrial parks located next to the two largest urban areas in the region, Hanoi and Hai Phong City (such as the model of the Nam Cau Kien Industrial Park - Hai Phong City at present).

b) Attracting foreign direct investment into eco-industrial parks

The orientations on attracting foreign direct investment into Vietnam, in general, have been mentioned many times in both research works and legal documents. In this study, based on the inheritance of ideas from published studies and policies from legal documents, the author proposes major orientations in attracting foreign direct investment into eco-industrial parks in the Red River Delta as follows:

(i) Regarding industries and fields, prioritize attracting FDI into high-tech, advanced, environmentally friendly industries and fields such as electronics, semiconductors, clean energy, renewable energy, medical equipment manufacturing, electric vehicles, etc. Screen and prevent FDI projects with outdated technology and the risk of causing environmental pollution.

(ii) Regarding partners, it is necessary to focus on attracting FDI flows from the world's leading developed countries, transnational corporations that possess advanced source technology and modern management skills, associated with strengthening the linkage of FDI enterprises with domestic enterprises to form and develop industry clusters according to each value chain in order to form industrial symbiosis in which FDI enterprises play the role of the core of the linkage. (iii) Regarding institutions, it is necessary to promptly study and promulgate mechanisms and policies to improve the investment environment as well as incentive and priority policies that are attractive enough to attract large corporations to invest in eco-industrial parks to help solve the problem of technology, finance and establish industrial symbiosis for the development of this model in the Red River Delta.

2.5. Solutions to attract foreign direct investment for the development of eco-industrial park models in the Red River Delta until 2030, with a vision to 2050

In addition to general solutions to promote foreign direct investment in localities in the Red River Delta, the author proposes and emphasizes fundamental solutions to attract foreign direct investment for the development of eco-industrial park models in the Red River Delta until 2030, with a vision to 2050, including:

2.5.1. Institutional solutions

- The Government should soon issue a document directing and orienting the need to develop a new model of eco-industrial parks (or convert existing industrial parks into eco-industrial parks) so that localities have a basis to develop implementation plans, creating a new trend in responding to the development of this model while providing public and transparent information in investment promotion activities to attract foreign direct investors.

- Develop incentive and priority policies (on rental prices, taxes, etc.) for foreign-invested enterprises in eco-industrial parks or industrial parks being converted into eco-industrial parks, especially for projects that meet O2 conditions: (i) a group of large-scale multinational corporations with large-scale projects from developed countries holding source technology and (ii) the investment sector belongs to the priority industry group, with widespread. Based on the general policy framework for the whole country, localities that prioritize the development of the eco-industrial park model can issue specific policies to increase competitiveness in attracting foreign direct investment into this model.

- Carry out well the inspection, examination, supervision, and evaluation of investment efficiency in eco-industrial parks in the region. Monitor and evaluate the actual implementation situation, especially for specific environmental standards of enterprises located in eco-industrial parks associated with industrial symbiosis; propose solutions for eco-industrial parks, actively remove obstacles, and ensure the effective operation of eco-industrial parks. Strengthen the

review, inspection, and revocation of licenses of projects that are behind schedule as committed, projects that are ineffective and violate the State's policies and laws.

2.5.2. Synchronous and modernized infrastructure solutions

- Focus on doing a good job of compensation and site clearance to attract investors; select investors with strong potential and high determination to invest in leveling and building infrastructure inside the eco-industrial park, in order to speed up the progress of infrastructure investment projects.

- Plan construction, reasonably design functional subdivisions, and orient to attract investment projects with similar industries and professions to support the implementation of industrial symbiosis. In which, investors implementing investment projects to build and operate the infrastructure of the eco-industrial park register industries and professions attracting investment in the industrial park; estimate emission levels for each industry and profession; Plan for industrial symbiosis in industrial parks, plan for building and implementing a mechanism for monitoring the input and output of industrial parks on the use of raw materials, materials, water, energy, chemicals, waste, scrap and plan for implementing social responsibility to the surrounding community in the project dossier for investment in construction and business of industrial park infrastructure;

- Ensure the completion of technical infrastructure that meets the conditions for implementing plans according to approved construction and design planning, especially for industrial symbiosis plans.

2.5.3. Regional linkage solutions in promoting foreign direct investment

Foreign direct investment enterprises invest with the ultimate goal of seeking profit. Therefore, in order to fulfill commitments to environmental standards for eco-industrial parks as well as to implement industrial symbiosis, the issue of handling input and output materials for each enterprise in the product chain to optimize economic efficiency is extremely important. To promote the formation of industrial symbiosis (both within an industrial park as well as between industrial parks located close to each other in the region), strengthening regional linkages in promoting foreign direct investment is extremely important. Through regional linkages in this activity, it contributes to forming or extending product chains between enterprises, including foreign direct investment enterprises and domestic enterprises. To promote regional linkages in promoting foreign direct investment in the region in general and in eco-industrial parks in particular, the role of the Red River Delta Regional Coordination Council and the response and coordination of localities in the region are decisive.

3. Conclusions

Foreign direct investment plays an important role in the investment recipient country in general and in the development of the eco-industrial park model in particular. The development situation in the previous period shows that, although attracting large-scale foreign direct investment flows and significant spillover effects, industrial parks in the Red River Delta are still developing according to the traditional model and the speed of green transition is still quite dim. In the coming period, the prospect of attracting foreign direct investment for the development of eco-industrial parks in the Red River Delta is quite bright based on the competitive advantages of the region as well as the trend of green economic development that is gradually becoming popular. However, the competitive challenges in attracting foreign direct investment from the traditional industrial park model as well as other regions are significant obstacles for the Red River Delta. From the development practice and the prospects and challenges in the upcoming context, the Red River Delta needs to pilot the planning of a number of eco-industrial parks from the beginning and at the same time convert a number of existing industrial parks into eco-industrial park models.

In order to increase the attraction of foreign direct investment for the development of eco-industrial parks, especially foreign direct investment flows from the world's leading developed countries, transnational corporations in high-tech, advanced, and environmentally friendly industries and fields, the region needs to focus on synchronous and effective implementation of solutions on institutional reform, synchronization and modernization of infrastructure along with strengthening regional linkages in promoting foreign direct investment. The results of this study are useful references for State management agencies in issuing policies related to attracting foreign direct investment and developing eco-industrial parks in Vietnam in general and the Red River Delta in particular.

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