



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



GEIPP

GLOBAL ECO-INDUSTRIAL PARKS PROGRAMME

ASSESSMENT OF COUNTRY-SPECIFIC SET OF EIP INDICATORS AND TESTING IN SELECTED INDUSTRIAL PARKS IN VIET NAM

BASELINE REPORT

31 October 2022



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

Swiss Confederation



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

©2022

This document has been produced without formal United Nations editing. The designations employed and the presentation of material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” or “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of any firms or commercial products does not constitute an endorsement by UNIDO.

Suggested citation: Lien Nguyen Thi Kim, Duc Hoang Le, Quynh Huong Pham, Nguyen Tram Anh, Alessandro Flammini. Assessment of Country-Specific Set of EIP Indicators and Testing in Selected Industrial Parks in Vietnam. 2022.

TABLE OF CONTENTS

Background	6
Introduction	7
Objectives	7
Scope of the Surveys	7
Conducting Surveys	7
Indicators Selection Methodology	7
Introducing the Indicators	9
Developing Questionnaires	9
Data Collection Method	10
Data analysis and selection of indicators	11
Criteria for Data Analysis	11
Analysis of Practicality.....	11
Analysis of Compliance.....	11
Analysis of Relevance.....	12
Analysis of Scientific Basis.....	12
Selection of Indicators.....	12
Suggested Indicators	12
Suggested Environmental Indicators.....	13
Suggested Park Management Indicators.....	15
Suggested Social Indicators	18
Suggested Economic Indicators	20
Calculation of the EIP Index	22
EIP Index for Selected IPs	23
Conclusions	28
List of appendices	30

List of acronyms

EIP	Eco-Industrial Park
GEF	Global Environment Facility
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation)
IF	International Framework
IFC	International Finance Corporation
IP	Industrial Park
IS	Industrial symbiosis
NDC's	Nationally Determined Contribution
MPI	Ministry of Planning and Investment
RECP	Resource Efficiency and Cleaner Production
PM	Park Management
SDG	Sustainable Development Goals
SECO	State Secretariat for Economic Affairs of the Government of Switzerland
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme

Background

Inclusive and sustainable industrial development has become a global trend due to a pressing need to balance economic, social, and environmental goals. The eco-industrial park (EIP) approach is a strategy to promote sustainability in industrial zones. EIP provides larger-scope solutions than product- or firm-specific sustainability interventions, as it not only involves changes at the firm or park level, but its environmental, social, and economic impacts can benefit local communities and nations¹.

From 2014 to 2019, the project “*Implementation of eco-industrial park initiative for sustainable industrial zones in Viet Nam*” was implemented by UNIDO in collaboration with MPI and with the financial support of GEF, SECO, and UNDP. The Project was undertaken to develop policies and guidelines to facilitate the transformation of industrial zones into EIP and implement its principles in four existing industrial zones in the provinces of Da Nang (Hoa Khanh IZ), Can Tho (Tra Noc 1 and 2 IZs), and Ninh Binh (Khanh Phu IZ and Gian Khau IZ), which serve as pilots to support replication and upscaling across Viet Nam. As a continuation of the successful implementation of this project, the project “*Eco-industrial Park Intervention in Vietnam -Perspective from Global Eco-industrial Park Program,*” funded by SECO, was launched in November 2020. Among other things, the project aims to support the development of policies for EIP. It continues to promote the deployment of eco-industrial park solutions in several industrial parks.

As part of the project, three industrial parks, including two “model” industrial parks (Amata and Deep C industrial parks) and one “significant improvement potential” industrial park (Hiep Phuoc IP), have been selected as pilot IPs which will be transformed to EIP through different interventions, including RECP assessments and identification of opportunities for industrial synergies.

The UNIDO project also supports MPI and the Government of Vietnam in the development of a country-specific set of indicators to be applied across the country to monitor the development of EIPs. This set of indicators will be used for periodic assessments to track the development and improvement of industrial parks.

The set of national EIP indicator will be based on existing indicators. These include:

- the EIP requirements based on the revised Decree 82/QĐ-TTg/2019, i.e., the recently issued Decree 35/2022/ NĐ-CP for industrial park management
- the International EIP Framework Edition 2, developed by UNIDO, World Bank, and GIZ
- Decision 681/QĐ-TTg/2019, which stipulates a roadmap for the implementation of Vietnam SDG toward 2030 and
- a set of environmental and socio-economic indicators suggested by the World Bank and UNIDO to MPI in 2018-2019.

¹ https://www.e3s-conferences.org/articles/e3sconf/pdf/2021/34/e3sconf_uesf2021_03002.pdf p.1

Introduction

Objectives

This assignment aims to screen the long list of existing indicators to develop a relevant shortlist (relevant and without overlaps) to be piloted in the seven industrial parks (in 6 provinces) where UNIDO and MPI have been implementing the project since 2014. The pilot phase included specific surveys to measure the shortlisted indicators among IP management authorities, IP developers, IP resident companies, and IP surrounding communities of selected industrial parks in Vietnam.

Scope of the Surveys

At IP level: there were 6 IPs selected for online and off-line interviews:

- » Hiep Phuoc IP (Ho Chi Minh city)
- » Amata (Dong Nai Province)
- » Deep C (Hai Phong city)
- » Tra Noc 1 &2 (Can Tho Province)
- » Khanh Phu (Ninh Binh province)

At the firm level, 74 tenant firms in those IPs were present for online and off-line interviews (See Appendix 3)

Conducting Surveys

Indicators Selection Methodology

The selection of indicators was done via the following steps:

Step1:

Environmental and PM indicators were identified based on the following sources:

- » The EIP International Framework version 2 (i)
- » Revised Decree 82 on EIP management or recently issued Decree 35/2022/ NĐ-CP (ii)
- » Decision 681/QĐ-TTg/2019, which stipulates a roadmap for the implementation of Vietnam SDG toward 2030 (iii)
- » ECO-Industrial parks Vietnam – Social and Economic indicator for Eco-industrial parks in Viet Nam² developed by UNIDO and MPI (iv)

² UNIDO, MPI (2019). ECO-Industrial parks Vietnam – Social and Economic indicator for Eco-industrial parks in Việt Nam.

Step 2:

An Excel file was developed to facilitate the process of indicator selection. Relevant contents (*described in the table headings*) for indicators selection were included:

- » Topic/Sub-topic
- » Description of indicators
- » Performance/Prerequisites indicators
- » Target value and its unit
- » Sources of the indicators (from the sources described in 2.1)
- » Scope of application (National, provincial/city, park, and enterprise-level)
- » Criteria for indicators selection (see Step 3 below)
- » Score
- » Methodology for data collection

The contents include a description of indicators, data sources, level of application, and methodology for data collection. The criteria were set for qualitative and quantitative indicators as described in Step 3 below.

Step 3: Selection of quantitative and qualitative indicators

Different methods were used to screen relevant quantitative and qualitative indicators.

Quantitative indicators:

Relevant indicators (based on Step 2 and extracted from i, ii, iii, and iv) were evaluated based on the following criteria:

- a) Data availability/accessibility (*Yes, no, unclear*)
- b) Is it easy to attain (*Easily, not quickly, more information*)
- c) Does the target have a potential for change in the future? (*High, low, unclear*)
- d) Are there technical or financial barriers to applying the indicator? (*Yes, no, unclear*)

A weight was assigned to each selection criterion. Then, those selection criteria were further sub-categorized, and values were assigned based on their importance for data collection and monitoring indicators.

Qualitative indicators:

Relevant indicators were evaluated based on the following selection criteria:

- a) Data availability/accessibility (*Yes, no, unclear*)
- b) Relevance (*High, low, unclear*)

A weight was assigned to each selection criterion. Then, those selection criteria were further sub-categorized, and values were assigned based on their importance for data collection and monitoring indicators.

Introducing the Indicators

The most relevant indicators were selected based on the experts' suggested indicators and several rounds of consultations with UNIDO and MPI experts. These indicators are deployed for drafting a questionnaire for in-depth interviews in parts 2.3 and 2.4 below. A list of those indicators is detailed in attached *Appendix 1*, which includes:

Environmental indicators

35 indicators were categorized into six main topics:

- » Resources efficiency and cleaner production (RECP), Industrial symbiosis (IS)
- » Energy
- » Water supply and wastewater
- » Wastes and material use
- » Natural environment and climate resilience
- » Management and monitoring

Park management indicators

20 indicators were categorized into four main topics:

- » Park management services
- » Risk monitoring and management
- » Planning and Zoning
- » Support from local government

Social indicators

19 social indicators include 11 indicators on the Social Management System, five indicators on the social infrastructure of the IP, and three indicators on community outreach.

Economic indicators

There are 27 economic indicators which are included in 5 topics, as follows:

- » Economic value added: 5 indicators
- » Industrial Symbiosis: 3 indicators
- » Employment generation: 3 indicators
- » Local business and SME promotion: 4 indicators
- » Economic value creation: 11 indicators
- » IP's financial viability: 1 indicator

Developing Questionnaires

From the selected indicators, three sets of questionnaires were developed to make the criteria suitable for the respective stakeholders, which are:

- » Park Management Authority,
- » Industrial Park's infrastructure developer (IP developer) and
- » Tenant firms.

The questionnaires were developed in consultation with experts from UNIDO and MPI and with stakeholders' inputs during face-to-face interviews at trial tests and at the execution phase during an on-site mission, as follows:

- » Firstly, the questionnaires were drafted by the national environment, social, and economic experts
- » UNIDO and MPI further reviewed them to have a first version for a first trial phase at one industrial park (Deep C)
- » The questionnaires were tested in Deep C Industrial Park with the participation of the Hai Phong Industrial Park management authority, the Deep C Industrial Park developer, and two tenant firms
- » After this trial test, the questionnaires were reviewed and adjusted to have a version ready for the on-site missions for data collection
- » During the face-to-face interviews conducted during on-site missions, the questionnaires were adjusted based on comments received from the interviewees.

Data Collection Method

- » The questionnaires were designed in Word format and as online Google forms to facilitate respondents in completing the questionnaires both offline and online.
- » The data collection was done by interviewing both online and offline, as follows:
 - The face-to-face interview was conducted in Ho Chi Minh City (Hiep Phuoc IP), Dong Nai Province (Amata), Da Nang City (Hoa Khanh IP), and Hai Phong City (Deep C)
 - The online interview was done for Can Tho (Tra Noc 1 and 2) and Khanh Phu IP (Ninh Binh Province)
- » The detailed list of the stakeholders invited for the interview is in *Appendix 3*.

Data analysis and selection of indicators

Criteria for Data Analysis

Besides measuring the actual EIP indicator, the data collection was aimed at assessing the following criteria for each EIP indicator:

- a) Practicality
- b) Compliance
- c) Relevance
- d) Scientific basis

Analysis of Practicality

- » The analysis of the practicality of the indicators focuses on what indicators could be measured by respondents, i.e., it measured the availability of the information to measure the indicator. In other words, it is based on the number of “To be confirmed,” “Data not available,” and “Not applicable,” over total responses.
- » A high proportion of “Yes” and “No” ratings (i.e., the indicator could be measured) indicates that the indicator is “practical” as data is available to validate its performance. Similarly, a high proportion of “To be confirmed” and similar responses illustrates that the indicator may not be very practical as data is mainly unavailable to validate its performance.
- » The formula to calculate the practicality is defined as follows:

$$\text{Practicality \%} = (\text{Counts "Yes" and "No"}) / (\text{Total number of responses})$$

Analysis of Compliance

The analysis of the compliance of the indicators focuses on which indicators were rated as “Yes” in the main and sub-questions. A high proportion of indicators rated as “Yes” means the indicator was easy to comply with in the assessed industrial parks. An indicator with very low compliance would not be suitable for Vietnam because it is too demanding or simply because it does not fit the Vietnamese context.

The formula to calculate the proportion of indicators was rated as “Yes” (in primary and sub-questions) out of the total responses for that question, as follows:

$$\text{Relevance \%} = (\text{Total number of "Yes"} / \text{Total number of responses}).$$

Regarding social indicators, social indicators apply selection in a particular way. The indicator is considered compliance when it complies with Decree 82 and the international EIP framework. It also means that it has been measured and reached the target value or threshold (rated as “yes”) or is likely to be achieved in the near term (2-3 years). Indicators that are not suitable for Vietnamese circumstances or are difficult to complete will be considered as having low relevance

Analysis of Relevance

- » The relevance is categorized into three levels: high, medium, and low, based on its significance for EIP development considering the following points:
 - Accordance with national legislation and international requirements: an indicator is relevant if it helps meet national and international requirements. However, it should not duplicate what is already required;
 - The benefits of the EIP concept: an indicator is relevant if it helps achieve essential/fundamental aspects of the EIP concept, as outlined in the EIP International Framework;
- » The indicator is considered as **High** relevance if it meets three requirements described above, **Average** if it meets two conditions, and **Low** if it meets one requirement.

Analysis of Scientific Basis

- » The analysis of scientific basis served to evaluate the applicability of indicators further, i.e., if the methodology to be followed to measure the indicator and the description of the indicator is clear enough. For example, indicators that, based on their report, imply a high degree of subjectivity in their measurement are not science-based.

Selection of Indicators

- » Specific thresholds have been introduced for the selection of indicators based on their calculation results of practicality (≥ 0.7), compliance (≥ 0.5), and other criteria indicated above. Details of calculations can be found in *Appendix 2*.

Suggested Indicators

- » As an outcome of the selection process described above, there are 23 recommended & optional indicators: six environmental indicators, four park management indicators, seven social indicators, and six economic indicators. Out of these, 20 indicators are recommended: 6 environmental, three park management indicators, six social indicators, and five economic indicators. The selection process results are detailed in the Excel file described in 3.1.5. The recommended and optional indicators are illustrated below:

Suggested Environmental Indicators

As a result, of the selection process, six indicators are suggested as follows:

Table 1. Suggested indicators for the environment

No	Indicator	Description of indicator	Levels of application	Recommended (Rec.)/Optional (Opt.)
1	D82.ENV.P1	Number of IS* realized in the IPs (01)	IP developers and firms	Rec. Ideally, the indicator should measure improvement over time by setting a target of, e.g., one realized IS/year. The methodology sheet should clarify what evidence to provide.
2	D82.ENV.P2	Percentage of firms within IPs having RECP** implemented (20%)	Firms	Rec., but ideally, the threshold should be increasing over time.
3	IF.ENV.P8	Percentage of total industrial wastewater from firms that are reused/recycled responsibly within or outside the industrial park (25%)	Firms and IP developer	Rec.

4	IF.ENV.R6	A program is established with clear evidence of steps taken to monitor, mitigate, and/or minimize GHG emissions, such as carbon dioxide (CO ₂), methane (CH ₄), and nitrogen oxides (NO _x).	IP developer	Rec.
5	D82.ENV.R1	Infrastructure developer enterprises in industrial parks shall establish a mechanism for coordination in monitoring inputs and outputs of materials, including the use of energy, water, chemicals, raw materials, and materials in industrial parks; make the annual reports on results achieved in RECP and emission control, report to IP developer.	IP developer	Rec.
6	D82.ENV.R2	Annually, IP and businesses of the industrial zones shall publish reports on the environmental protection and social responsibility towards employees and surrounding communities to the IP developer, to be posted on the enterprise's website.	IP developer	Recommended, but the option for report publishing into the website is optional for tenant firm

*: **Industrial symbiosis** refers to cooperation between enterprises within an industrial park or with enterprises within various ones to optimize the use or reuse of input and output factors, such as raw materials, water, energy, waste, scrap, by-products, etc., during the manufacturing and business process.

.: **Resource efficient and cleaner production (RECP) entails the continuous application of preventive environmental strategies to processes, products, and services to increase efficiency and reduce risks to humans and the environment (UNIDO: [https://www.unido.org/our-focus-safeguarding-environment-resource-efficient-and-low-carbon-industrial-production/resource-efficient-and-cleaner-production-recp](https://www.unido.org/our-focus/safeguarding-environment-resource-efficient-and-low-carbon-industrial-production/resource-efficient-and-cleaner-production-recp))

Suggested Park Management Indicators

As a result of the selection process, four indicators are suggested as follows:

Table 2. Suggested Indicators for Park Management

No	Indicator	Description of indicator	Levels of application	Recommended (Rec.)/Optional (Opt.)
1	IF.PM.R3	<p>Park management entity maintains an EIP framework monitoring system in place, tracking, and reporting:</p> <ul style="list-style-type: none"> • Progress on environmental, social, and economic performance at the park level annually. • Critical risk factors and related responses, at least for: <ul style="list-style-type: none"> ✓ Risk points for the accidental release of hazardous solid, liquid, and gaseous effluents, including during transportation and disposal when fire hazards are possible and ✓ Applicable natural disaster risks (for example, earthquakes); 	IP developer	Rec.

		<ul style="list-style-type: none"> ✓ Environmental performance; ✓ Social performance; ✓ Economic performance; and ✓ Critical risk management at the level of the park. <ul style="list-style-type: none"> • Acts as monitoring and pre-clearing institution for environmental issues on behalf of the regulatory bodies, as delegated. • May operate a central environment control unit with an emergency alert system for environmental and other hazards. 		
2	IF.PM.R4	Park management has a plan, to be updated every seven years, in place to react to possible negative impacts due to climate change (heat waves and droughts, storms, and floodwater events)	IP developer	Rec.
3	D82.PM.R4	The management board of the industrial park shall assign a public non-business unit directly under the management board or an appropriate team to perform the function of the building, providing information and a database on the resource efficient and cleaner production (RECP), proposing solutions, and connect enterprises to implement industrial symbiosis; providing supporting services for transition or new construction of eco-industrial parks	IP developer	Rec

4	D82.PM.R6	Investors implementing investment projects on infrastructure construction are required to register for investment attraction industries and trades, estimate emission loads for each sector, propose a plan for the realization of industrial symbiosis, the plan for setting up and implement a mechanism to monitor the inputs and outputs of the industrial park on the use of raw materials, materials, energy, water, chemicals and the implementation plan of social responsibility towards employees and the surrounding community in the dossier of investment project on the infrastructure construction and business of the industrial park	IP developer	Optional
---	-----------	---	--------------	----------

Suggested Social Indicators

Table 3: Suggested Social Indicators

No.	Code indicator of	Description of indicator	Level of application	Recommended (Rec.)/Optional (Opt.)
1	IF.SOC.P4 ³	The proportion of firms with more than 250 employees have a code of conduct system to deal with grievances ($\geq 75\%$).	Firms	Rec., but in Vietnam, it is not expected to have firms with more than 250 employees in IPs. Therefore, extending the application to companies with more than 100 employees is suggested.
2	D82.SOC.1	The proportion of firms that have a Disclosure and Accountability System fully provided in the site master plan and are fully operational within the park ($\geq 75\%$).	IP developer	Rec.

³ also consistent with Decree 82, Article 45

3	IF.SOC.R2 ⁴	Essential primary social infrastructure has been adequately provided in the site master plan and is fully operational in the park (Yes).	IP developer	Rec.
4	UNIDO.SOC.8	Percentage of all firms in the industrial park with more than 250 employees that apply gender equality at work in social insurance, health insurance, medical check-ups, occupational safety training, and cleaner production training (≥50%).	Firm	Rec. but the 'cleaner production training' requirement is covered by other ENV indicators.
5	IF.SOC.P5	The proportion of firms with more than 250 employees that have a harassment prevention and response system in place (≥75%).	Firm	Rec.
6	IF.SOC.R1	Dedicated personnel exist (as part of the park management entity) to plan, manage, and enforce social quality standards (Yes).	IP developer	Rec.
7	UNIDO.SOC.4	Increase in annual spending towards local community engagement and yearly dialogue.	IP developer	Opt.

⁴ also consistent with UNIDO & MPI, EIP Việt Nam Socio-Economic Indicators. Decree 82, Article 32, Article 42.6

Suggested Economic Indicators

As a result of the selection process, six economic indicators (5 recommended indicators and one optional indicator) are selected as follows:

Table 4. Suggested Economic Indicators

No	Indicator	Description	Level of application	Recommended (Rec.)/Optional (Opt.)
1	D82.ECO.12	Park management entity has a plan with clear evidence that it offers a unique opportunity to consolidate business action across the tenant companies.	IP developer	Rec.
2	IF.ECO.R6	The Park management entity is responsible for marketing the park and park concepts (EIP concept) to potential national and international investors.	IP developer	Rec.
3	IF.ECO.R2	The Park management entity has a strategy in place to maximize local benefits.	IP developer	Rec.
4	IF.ECO.R1	Park management entity allows and promotes the establishment of SMEs that	IP developer	Rec.

		provide services and add value to park residents. (Yes)		
5	UNIDO.ECO.P11	An EIP must use local suppliers where possible. EIPs provide local businesses with opportunities to grow. (Yes)	IP developer	Opt.
6	IF.ECO.R7	IPs can render their services at realistic costs to cover operational expenditures. (Yes)	IP developer	Rec.

» **Note:** Indicators “Investment on eco-industrial initiatives,” “Support companies in value chain linkages,” and “Local value added” are optional because the compliance level of the three indicators is the lowest among the 9 indicators above. This suggests that the questions may not meet the actual condition at the time of the survey.

» **Legend:**

i) The indicator is assigned with the indicator's Code: It is coded based on: i) The source of the index. Specifically, the **IF** is from the International Framework source. **D82** is based on the amended Decree 82. **UNIDO** is from the Vietnam Survey Report conducted by UNIDO and MPI⁵. ii) Topic of the indicator, e.g., ENV means the indicator belongs to the environment part, PM means the indicator belongs to park management, ECO means the indicator belongs to the economic part, SOC means the indicator belongs to social part iii) **R** is assigned to prerequisite indicator; **P** is assigned to Performance indicator (if relevant). For example:

IF.ENV.R1: International Framework, Environment, Prerequisite, Indicator No. 1.

UNIDO.SOC.R.1 = UNIDO & MPI Survey’s report, Social, Prerequisite, Indicator No. 1.

D82.SOC.R.1 = Decree 82, Social, Requirement/prerequisite, Indicator No. 1

IF.ECO.R5: International Framework, Economic, Prerequisite, Indicator No. 5.

Calculation of the EIP Index

» An EIP index based on the recommended indicators has to be proposed as part of this assignment. For demonstration, a methodology to calculate the EIP Index based on the assessment of two IPs (Amata IP and Hiep Phuoc) w.r.t their performance for the environment. Park management, social and economic, is reported below.

» The formula for the calculation of the EIP Index is:

$$EIP\ Index = \sum_{k=1}^n \frac{i_k}{n}$$

Where:

» i = value of indicator (1 for ‘indicator met’ and 0 for ‘indicator not met’)

» n = number of applicable indicators (for which information is available)

» Based on the survey results, the IP’s performance is evaluated against recommended and optional indicators, i.e., the indicators met or not were assigned with values of 1 and 0, respectively. Besides, a weight is assigned for each indicator, based on its relevance for EIP, as follows:

» **3** for prerequisite indicators (Indicator assigned with R, e.g., D82.PM.R6 in Table 2)

⁵ UNIDO, MPI (2019). Eco-Industrial parks Vietnam – Social and Economic indicator for Eco-industrial parks in Việt Nam.

1 and 2 for performance indicators (Indicator assigned with P, e.g., IF.ENV.P8 in Table 1), depending on its importance for EIP.

Once fixed, the weights should not be changed to allow comparison across industrial parks.

EIP Index for Selected IPs

For demonstration, an EIP index is calculated for three specific IPs: Amata and Hiep Phuoc. The results are illustrated below:

Table 5. EIP index for Amata (environment, park management, economic and social parts)

I. ENVIRONMENT				
Indicator	Example: Result of measurement in one IP. Indicator met?	Value (0-1)	Weight based on relevance for EIP (1-3)	Contribution towards EIP index
Resources efficiency (RECP), Industrial symbiosis (IS)				
D82.ENV.P1	No	0	2	0.00
D82.ENV.P2	No	0	2	0.00
Water supply and wastewater				
IF.ENV.P8.	No	0	2	0.00
Natural environment and resilience				
IF.ENV.R6	Yes	1	3	0.19
Management and risk monitoring				
D82.ENV.R1.	Yes	1	3	0.19
D82.ENV.R2	Yes	1	3	0.19
			Subtotal	0,57
II. PARK MANAGEMENT				
Park management services				
D82.PM.R4	No	0	3	0
D82.PM.R6	Yes	0	3	0.25
Management and risk monitoring				
IF.PM.R3	Yes	1	3	0.25
IF.PM.R4	No	0	3	0.00
			Subtotal	0.50
III. ECONOMIC				
Economic value creation				

D82.ECO.R.12	No	0	2	0.00
IF.ECO.R.6	Yes	1	3	0.18
Employment generation				
IF.ECO.R..2	Yes	1	3	0.18
Local business and SME promotion				
IF.ECO.R.1	Yes	1	3	0.18
UNIDO.ECO.P.11	No	0	2	0.00
Park entity's financial viability and financial support of industrial park for companies				
IF.ECO.R.7	No	0	3	0.00
			Subtotal	0.54
I. SOCIAL				
IF.SOC.P.4.3	Yes	1.00	2	0.00
D82.SOC.R.1	No	0.00	3	0.17
IF.SOC.P.2	Yes	1.00	2	0.10
UNIDO.SOC.R.8	Yes	1.00	3	0.00
IF.SOC.P.1	Yes	1.00	2	0.11
IF.SOC.P.5	Yes	1.00	2	0.11
UNIDO.SOC.R.4	Yes	1.00	3	0.00
			Subtotal	0.82
AVERAGE for I, II, II, I and IV				0.60

Table 6. EIP Index for Hiep Phuoc (environment, park management, economic and social parts)

I. ENVIRONMENT				
Indicator	Example: Result of measurement in one Indicator met?	Value (0-1)	Weight based on relevance for EIP (1-3)	Contribution toward the EIP index
Resources efficiency (RECP), Industrial symbiosis (IS)				
D82.ENV.P1	Yes	1	2	0.19
D82.ENV.P2.	No	0	2	0.00
Water supply and wastewater				0.00
IF.ENV.P8.	No	0	2	0.00
Natural environment and resilience				0.00
IF.ENV.R6	No	0	3	0.00
Management and monitoring				
D82.ENV.R1.	No	0	3	0.00
D82.ENV.R2	Yes	1	3	0.19
			Subtotal	0.38
II.PARK MANAGEMENT				
Park management and services				
D82.PM.R4	No	0	3	0.00
D82.PM.R6	Yes	1	3	0.25
Management and risk monitoring				0.00
IF.PM.R3	Yes	1	3	0.25
IF.PM.R4	No	0	3	0.00
			Subtotal	0.50
II. ECONOMIC				
Economic value creation				
D82.ECO.R.12	No	0	2	0.00
IF.ECO.R.6	Yes	1	3	0.18
Employment generation				
IF.ECO.R.2	Yes	1	3	0.18
Local business and SME promotion				

IF.ECO.R.1	Yes	1	3	0.18
UNIDO.ECO.P.11	No	0	2	0.00
Park entity's financial viability and financial support of industrial park for companies				
IF.ECO.R.7	Yes	1	3	0.18
			Subtotal	0.72
IV. SOCIAL				
IF.SOC.P.4.3	Yes	1.00	2	0.10
D82.SOC.R.1	No	0	3	0
IF.SOC.P.2	Yes	1.00	2	0.10
UNIDO.SOC.R.8	Yes	1.00	3	0.15
IF.SOC.P.1	Yes	1.00	2	0.10
IF.SOC.P.5	Yes	0.00	2	0.10
UNIDO.SOC.R.4	Yes	0.00	3	0.15
			Subtotal	0.70
			Average (I, II, III, and IV)	0.58

Table 7. EIP Index for Deep C (environment, park management, economic and social parts)

Indicator	Example: Result of measurement in one IP. Indicator met?	Value (0-1)	Weight based on relevance for EIP (1-3)	EIP index
I. ENVIRONMENT				
Resources efficiency (RECP), Industrial symbiosis (IS)				0
D82.ENV.P1	No	0	3	0.00
D82.ENV.P2	No	0	2	
Water supply and wastewater				
IF.ENV.P8.	Yes	1	2	0.13
Natural environment and resilience				0.00
IF.ENV.R6	No	0	3	
Management and monitoring				0.00
D82.ENV.R1.	Almost Yes (2/3)	0.7	3	0.19
D82.ENV.R2	Yes	1	3	0.19
			Subtotal	0.51
II. PARK MANAGEMENT				
Park management and services				

D82.PM.R4	No	0	3	0.00
D82.PM.R6	Yes	1	3	0.25
Management and risk monitoring				0.00
IF.PM.R3	Yes	1	3	0.25
IF.PM.R4	Yes	1	3	0.25
		Subtotal		0.75
III. ECONOMIC				
D82.ECO.R12	Yes	1	3	0.18
IF.ECO.R6	Yes	1	3	0.18
IF.ECO.R2	Yes	1	3	0.18
IF.ECO.R1	Yes	1	3	0.18
UNIDO.ECO.P11	No	0	2	0.00
IF.ECO.R7	Yes	1	3	0.18
		Subtotal		0.90
IV. SOCIAL				
IF.SOC.P.4.3	Yes	1.00	2	0.12
D82.SOC.R.1	Yes	1.00	3	0.18
IF.SOC.P.2	Yes	1.00	2	0.12
UNIDO.SOC.R.8	Yes	1.00	3	0.18
IF.SOC.P.1	Yes	1.00	2	0.12
IF.SOC.P.5	Yes	1.00	2	0.12
UNIDO.SOC.R.4	No	0.00	3	0.00
		Subtotal		0.84
		Average (I, II, I, I and IV)		0.75

Conclusions

- » These are recommendations based on the analysis and the pilot testing of the EIP indicators in 4 industrial parks across provinces:
- » In total 39 EIP indicators were assessed, and 23 indicators are suggested to be applied to Vietnam, of which:
 - 6 indicators for the environment (6 recommended and the extension of 1 to firmsFouroptional)
 - 4 indicators for park management (3 recommended and 1 optional)
 - 6 economic indicators (5 recommended and 1 optional)
 - 7 social indicators (6 recommended and 1 optional)
- » The overall practicality of indicators for the three groups of stakeholders (park management authority, IP developer and tenant firms) is 73%, 77%, 79% and 83% (an average of 78%) for economic, social, environmental and park management indicators, respectively. This includes an assessment of all recommended and optional indicators. The result (81%) obtained from previous UNIDO research conducted in 50 IPs ⁶ in 8 countries is very close to the result. It shows that, in general, the indicators can be used as a practical means to assess the EIP performance of an industrial park. However, the Government may apply only a subset of indicators (e.g., because they are more straightforward to measure).
- » The overall indicator compliance for the three groups of stakeholders (park management authority, IP developer and tenant firms) is 0.46; 54%, 0.62 and 69 % for economic, environmental, social, and park management indicators, respectively (an average of 58%). It is also in the range of results (57%) obtained from GEIPP research conducted in 50 IPs, as indicated above ⁷. It shows that the overall compliance level of the surveyed IPs in Vietnam is the same level as the other 51 IPs across the eight surveyed countries the project covers. However, the performance of environmental indicators of these surveyed IPs needs to be improved to meet the requirements set forth for EIPs, both national and international.
- » Calculating the EIP index can be a useful tool to evaluate an IP's performance. If done correctly by measuring indicators based on methodological guidance to ensure coherent results, it may allow to compare the performance of different IPs across the country. In addition, it would help IP managers evaluate their own IP performance and subsequently make decisions to improve it as a continuous improvement process.
- » It would be useful if benchmarking for the EIP index is set, and a monitoring and reporting system is developed to facilitate MPI in evaluating the development of EIP and its eco-business across Vietnam, particularly during the implementation of the

⁶ van Beers, D.; Tyrkko, K.; Flammini, A.; Barahona, C.; Susan, C. Results and Lessons Learned from Assessing 50 Industrial Parks in Eight Countries against the International Framework for Eco-Industrial Parks. *Sustainability* 2020, 12, 10611. <https://doi.org/10.3390/su122410611>

⁷ As above, p. 37

new Decree 35/ND-CP/2022 on the management of industrial parks and economic zones.

List of appendices

APPENDIX 1 – Long list of indicators (the Excel file)

APPENDIX 2 – Detailed calculation sheets (the excel)

APPENDIX 3 – List of firms that participated in the interview



Vienna International Centre
Wagramerstr. 5, P.O. Box 300,
A-1400 Vienna, Austria



+43 1 26026-0



www.unido.org



unido@unido.org



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION