



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Manual for UNIDO Toolbox on Eco-Industrial Parks



Global Eco-Industrial Parks Programme (GEIPP)

Knowledge Management Development

Acknowledgements

The authors would like to express their gratitude to all persons who contributed to the UNIDO eco-industrial parks Toolbox.

Special acknowledgements to:

- Authoring team of the toolbox: Frédéric David Meylan, Dick van Beers, Alessandro Flammini, Elisabeth Mueller, Cesar Barahona, and Smail Alhilali.
- UNIDO leadership: Christian Susan (Project Manager of Global Eco-Industrial Parks Programme (GEIPP), Smail Alhilali (Chief, Emerging Compliance Regimes Division), Nilgun Tas (Chief and Deputy Director, Industrial Resource Efficiency Division), and Stephan Sicars (Director of the Department of Environment).
- UNIDO Country Level Intervention Managers: Carolina Gonzalez (Egypt), Petra Schwager (Peru and Ukraine), Jérôme Stucki (Vietnam) and Christian Susan (Colombia).
- National Cleaner Production Centres for providing feedback and piloting testing the tools in international EIP projects.
- The toolbox developed has also benefited greatly from the continuous institutional contributions to this topic from RECPnet and its members (www.recpnet.org).
- This toolbox has also benefited from the contributions of Suren Erkman (University of Lausanne), Ignes Contreiras (University of Lausanne), Emina Alic (UNIDO), Branko Dunjic (UNIDO Consultant), and Nadia Zuodar (UNIDO Consultant).
- The graphic design of the tools was realized by Johannes Krenner, Joker Design.

© Photos: Provided by partners.

The EIP work stream under the Global Resource Efficient and Cleaner Production (RECP) Programme (2012 – 2018) and the Global Eco-Industrial Parks Programme (GEIPP) (2019-2023) are made possible by funding provided by the Swiss Government through State Secretariat for Economic Affairs of Switzerland (SECO).

Disclaimer

© UNIDO 2019. All rights reserved.

This document has been produced without formal United Nations editing. The designations employed and the presentation of the 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 judgement about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

The views expressed in this document are those of the authors and do not necessarily reflect the views of UNIDO and its governing bodies, nor of the Swiss Government.

Acronyms

EIP	Eco-Industrial Park
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
NCPC	National Cleaner Production Centre
RECP	Resource Efficient and Cleaner Production
SECO	State Secretariat for Economic Affairs of Switzerland
SME	Small and Medium Enterprise
UNIDO	United Nations Industrial Development Organization
WBG	World Bank Group

More information, suggestions or need support?

The current version of the UNIDO EIP Toolbox and its manual represents version 1.0. It is envisaged that the set of tools will be updated and expanded to reflect learnings from their ongoing applications in EIP projects.

UNIDO welcomes to hear from users of the toolbox about suggestions for improvement and any questions that may arise from the application of the tools.

UNIDO welcomes the opportunity to discuss options and available support on EIPs with interested stakeholders. The types and level of support offered will depend on the specific local needs and context of the industrial park.

For questions and technical advice on the implementation of EIPs, please feel to get in touch with us at EIP@unido.org.

You can download the tools here: <https://open.unido.org/projects/C6/projects/170222>.

Introduction

Eco-industrial parks

International best practice illustrates that the types of economic, environmental, and social benefits from Eco-Industrial Parks (EIPs) vary greatly, transcending conventional business case benefits. EIPs enable benefits from greater collaboration between tenant companies, service providers and local communities, allowing companies to transform environmental problems into efficiency gains, by using resources more effectively and enabling companies to draw on common services and infrastructure.

Throughout the world, eco-industrial park approaches are characterized by different definitions, classifications and contexts. A recent UNIDO study on the review of eco-industrial park practices¹ concluded the following:

- Eco-industrial parks mean different things to different parties;
- Practice does not yet match ambition;
- Process and continuous improvement-based approaches appear most useful;
- Lack of experience, awareness, supporting regulations and their enforcement slow down the development and implementation of eco-industrial parks;
- Many good practice elements exist, yet need to be brought together and implemented routinely in planning, development and management of industrial parks.

The following definition, commonly employed by UNIDO, recognizes the importance of the three pillars of sustainable development and of integrating EIP considerations into all phases of the development and operations of industrial parks:

“A community of manufacturing and service businesses located together on a common property. Member businesses seek enhanced environmental, economic, and social performance through collaboration in managing environmental and resource issues.”²

In this regard, compliance with national and local regulations is the baseline for all industrial parks, whatever the geographical location and specific characteristics of the park. Eco-industrial parks therefore should go beyond compliance with local and national regulations on environmental and social requirements (“compliance+”).

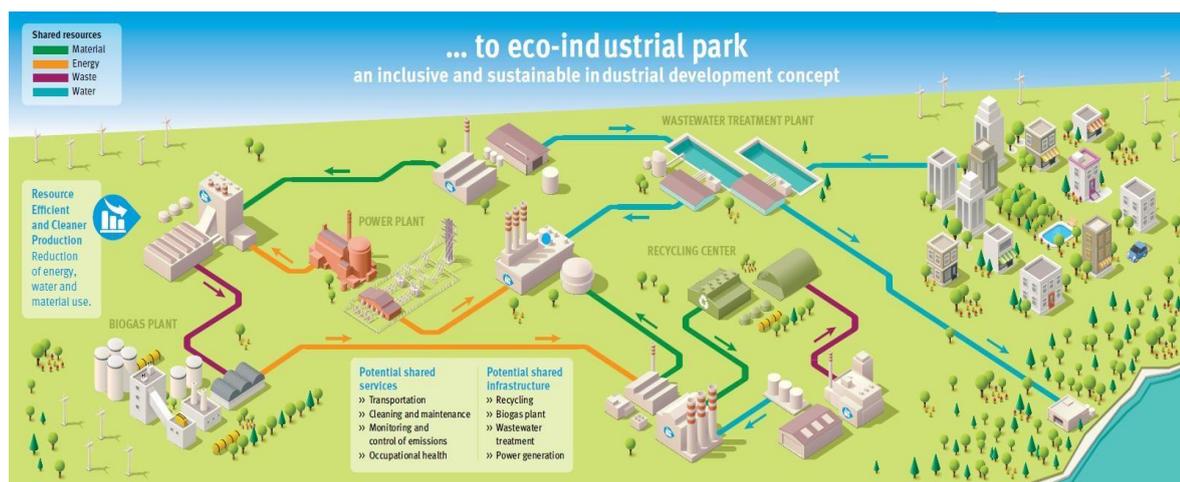


Figure 1: The eco-industrial park concept

1 UNIDO (2016). Global assessment of eco-industrial parks in developing and emerging countries: Achievements, good practices and lessons learned from thirty-three industrial parks in twelve selected emerging and developing countries.

2 Lowe, E.A. (2001). Eco-industrial parks: A handbook. Asian Development Bank, Manila, Philippines.

UNIDO’s experiences in eco-industrial parks

The United Nations Industrial Development Organization (UNIDO) is a specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. UNIDO aims to contribute to inclusive and sustainable industrial development by improving the environmental performance, resource productivity and safety of existing industries, as well as by supporting the creation of new industries that provide environmental goods and services.

Since 2012, the work of UNIDO in the area of eco-industrial parks has expanded under the joint global Resource Efficient and Cleaner Production (RECP) programme with the United Nations Environment Programme (UNEP), funded by the Swiss State Secretariat of Economic Affairs (SECO).

This programme conducted a global assessment of eco-industrial parks (EIPs) in developing countries, targeting 33 industrial parks in 12 countries (UNIDO, 2016). Since 2015, UNIDO has implemented EIP pilot projects in six countries under the Global RECP Programme (China, Colombia, India, Morocco, Peru and South Africa). One additional EIP country project is implemented in Viet Nam, with the support of the Global Environment Facility (GEF) and SECO.

These activities can be considered as a first step towards the mainstreaming of the EIP concept, which forms the basis of the Global Eco-Industrial Parks Programme (GEIPP), which started in early 2019, funded by the government of Switzerland through SECO. The objective of the GEIPP is to demonstrate the viability and benefits of greening industrial parks by improving resource productivity and economic, environmental and social performances of businesses, thereby contributing to inclusive and sustainable industrial development in the participating developing and transition economies. An overview of the outcomes of the GEIPP is presented in the figure below.

As part of the GEIPP, the country level interventions will implement tailor-made initiatives in five countries initially: Colombia, Egypt, Peru, Ukraine and Viet Nam. The Global Knowledge Development of the GEIPP will focus on the development of specific EIP tools and the dissemination of lessons learnt from international experience. It will build upon activities undertaken during the previous Global RECP Programme and will further advance collaboration between UNIDO and other leading international organizations working on EIPs.

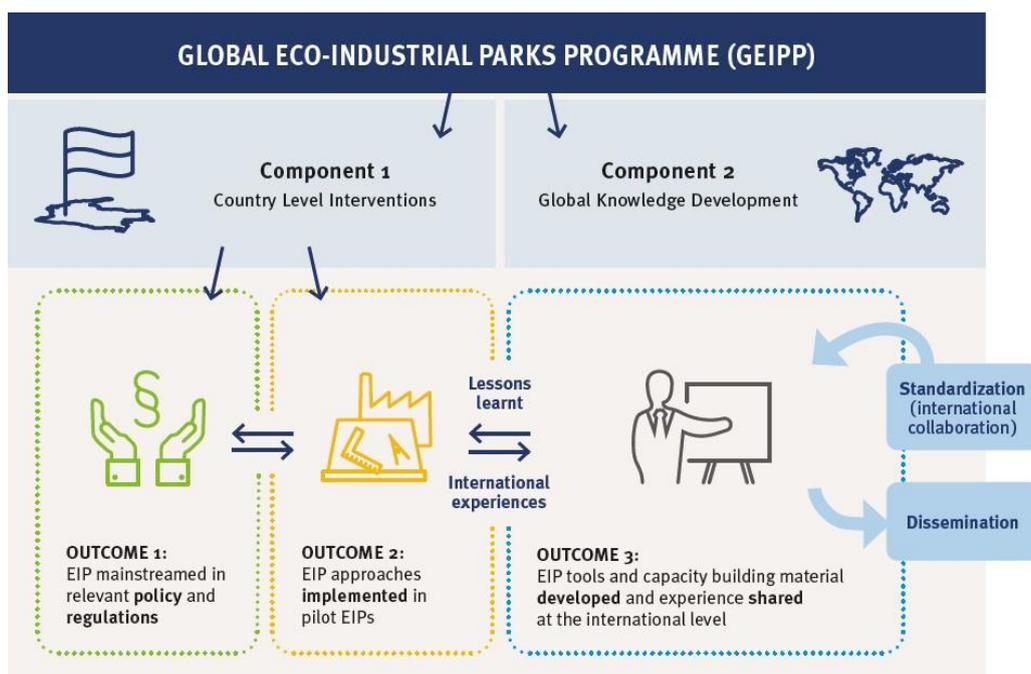


Figure 2: Approach of the Global EIP Programme

A number of handbooks, brochures, tools and materials have been developed to support the implementation of EIP strategies.³ UNIDO has collaborated with international organizations to provide a common vision for EIPs. For instance, a close cooperation between UNIDO, the World Bank Group and the German Development Cooperation (GIZ) enabled to develop an international framework for eco-industrial parks⁴. This framework provides a common understanding of EIPs and an approach for defining minimum performance requirements for EIPs. The Practitioner's Handbook for Eco-Industrial Parks was published to support the implementation of the international framework for EIPs. This handbook is also intended for development agencies to serve as a reference point in helping governments establish their respective national EIP Frameworks.⁵

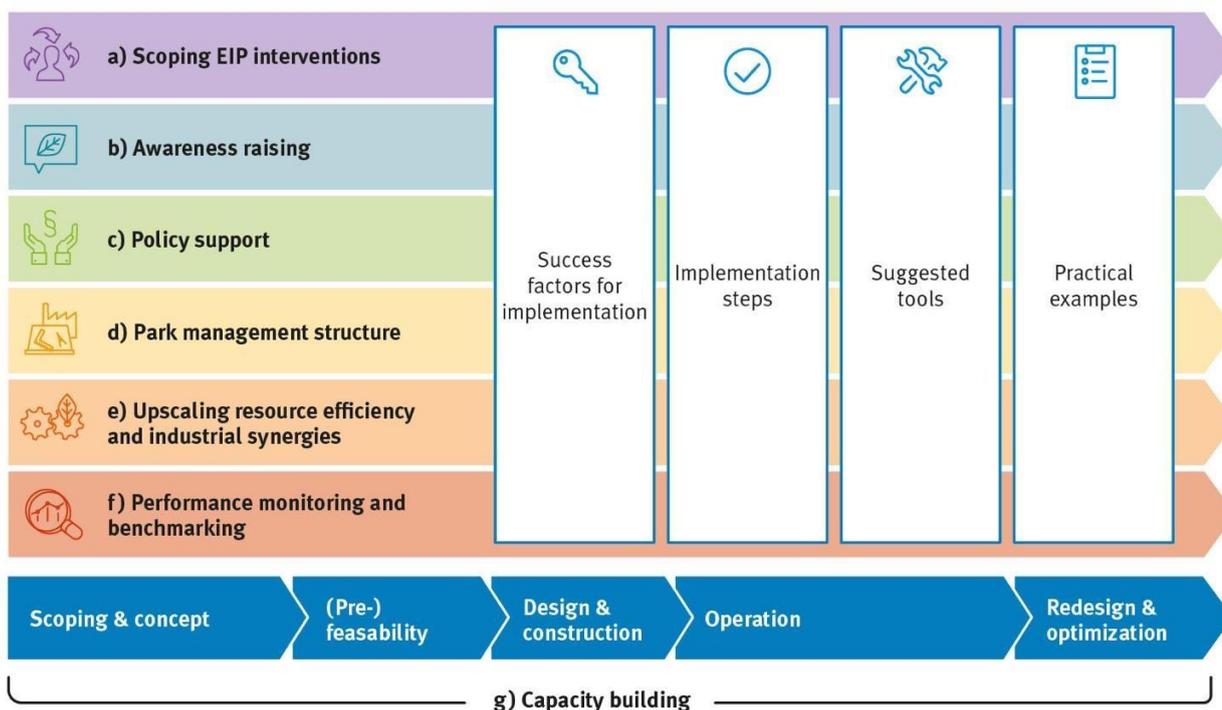


Figure 3: UNIDO Approach and support on eco-industrial parks

³ <https://www.unido.org/our-focus-safeguarding-environment-resource-efficient-and-low-carbon-industrial-production/eco-industrial-parks>

⁴ An International Framework for Eco-Industrial Parks, UNIDO, World Bank Group and GIZ (2017). English version: <http://documents.worldbank.org/curated/en/429091513840815462/An-international-framework-for-eco-industrial-parks>

⁵ A Practitioner's Handbook for Eco-Industrial Parks : Implementing the International EIP Framework: <http://documents.worldbank.org/curated/en/373911537194076697/pdf/129958-WP-PUBLIC-A-Practitioners-Handbook-for-Eco-Industrial-Parks.pdf>

UNIDO's EIP Toolbox

Rationale and objective of the EIP Toolbox

Various publications have been developed to bring together the technical experience of UNIDO in developing and implementing EIP projects (e.g. see suggested further reading at end of this manual).

To support these guidelines and handbooks, the objectives of UNIDO's EIP Toolbox are to:

- Provide a practical set of customised and flexible tools to assist practitioners with the development and implementation of eco-industrial parks and related initiatives;
- Support EIP implementation and decision making processes in relation to existing and new industrial parks.

Target users and application of the EIP Toolbox

The targeted users of the EIP tools are staff of international development organizations and supporting service providers working on eco-industrial park projects. The EIP Toolbox covers all key components of eco-industrial parks, including Resource Efficient and Cleaner Production (RECP), development of industrial synergies, strengthening park management, park selection and scoping EIP interventions, policy support and capacity building. This toolbox is intended to be applicable to:

- Industrial parks in various international contexts with a core focus on transition and developing countries;
- All development stages of industrial parks (e. g. scoping and concept planning, (pre-)feasibility studies, investment decisions, design and construction, operation, redesign and optimization);
- Industrial parks with different characteristics (e. g. types of industry sectors in park, park size, level of technology development, park management model).

Overview of the UNIDO's EIP Tools

An overview of UNIDO's EIP tools is presented in Figure 4, including their scope (e.g. focus on existing versus new industrial parks, technical versus organisation/political assessments).

UNIDO's EIP Tools	Scope of the tools			
	Existing industrial parks (Brownfields)	New industrial parks (Greenfields)	Technical	Organisational and political
EIP Selection Tool	√	(√)	√	√
Stakeholder Mapping Tool	√	√		√
EIP Policy Support Tool	√	√		√
EIP Assessment Tool	√		√	√
Industrial Symbiosis Identification Tool	√	√	√	
RECP Monitoring Tool	√		√	
Industrial Synergies Monitoring Tool	√		√	

Figure 4: Overview of UNIDO's EIP Tools

Introduction to the EIP Tools

Please find below an introduction to the current set of UNIDO's EIP Tools, including their specific objectives, steps in the tool application and explanatory notes. Detailed instructions are included as a separate worksheet in each tool (each tool is available as a separate Excel file). The Stakeholder Mapping Tool will be available soon.

EIP Selection Tool

Tool objective:	Support the selection of industrial parks with high potential for EIP development and creating successful EIP projects.
Steps in tool application:	<ol style="list-style-type: none"> 1) Pre-selection: Exclude industrial parks which do not meet minimum criteria for UNIDO EIP projects from the selection process. 2) Basic information: Provide basic information (e.g. management model, size, industrial sectors, number of companies, existing infrastructures) about the industrial parks. 3) Prioritization: Answer questions related to a set of criteria, which will assist in prioritization and selecting the most suitable industrial park(s) for an EIP project. 4) Review: Quick self-assessment of prioritized parks against the International Framework for Eco-Industrial Parks (UNIDO, World Bank, GIZ, 2017). This review provides insights into their current performance and their intended performance envisaged at the end of the EIP project (in terms of % of EIP benchmarks fulfilled).
Explanatory notes:	This tool is especially useful to assist in the selection of existing industrial parks that could be transformed in EIPs (brownfield), but it can also be used for the selection of area(s) that will host a new EIP (greenfield).

EIP Policy Support Tool

Tool objective:	Support policy development and implementation processes and government decision-making with regards to eco-industrial parks.
Steps in tool application:	<p>The tool is organised into the following modules:</p> <ol style="list-style-type: none"> 1) Main menu with overview of the tool components and means to navigate through the different modules. 2) Assess stakeholders on their suitability for participating in the EIP policy process. 3) Assist with defining a policy vision/goal for eco-industrial park development. 4) Create an overview of existing policies and governance structures relevant to EIPs in the country, and potential for integrating EIP into existing policies/structures. 5) Prioritize policy interventions by creating an understanding of potential trade-offs between EIP policy intervention options through multi-criteria decision analysis. 6) Present an overview of EIP related policy instruments and assist in selecting most suitable policy instruments for EIP related policies. 7) Assist in the scoping of EIP policy intervention actions as part of UNIDO projects on eco-industrial parks. 8) Suggestions for further reading.
Explanatory notes:	The applicability of different modules will depend on the specific scope of the policy work in EIP projects. Through the main menu, the user can easily navigate to the module(s) of your specific interest.

EIP Assessment Tool

Tool objective:	Assess an industrial park against an International Framework for Eco-Industrial Parks (UNIDO, WBG, GIZ, 2017) and subsequently prioritize, plan, manage and monitor their eco-industrial park initiatives. It can be used and adapted to all types of existing (brownfield) industrial parks and management structures (e.g. private company, public authority, public private set-up, real estate).
Steps in tool application:	<ol style="list-style-type: none"> 1) Assess industrial park performance against the requirements in the International Framework for eco-industrial parks. 2) Select EIP opportunities which are most achievable and beneficial. 3) Plan, manage and monitor progress on prioritized EIP opportunities.
Explanatory notes:	Recognising that park management may already have monitoring and management systems in place, it is envisaged that the planning, management and monitoring of prioritized EIP opportunities (Step 3) is adapted to suit the specific requirements of park management.

Industrial Symbiosis Identification Tool

Tool objective:	Support the identification of by-product synergies and waste exchanges (industrial symbiosis).
Steps in tool application:	The tool can be used to identify potential industrial symbiosis: <ol style="list-style-type: none"> 1) Related to a given material ("Search by product"). 2) Related to a given company ("Search by company"), to generate a list of inputs and outputs related to a specific industry.
Explanatory notes:	This tool can be used in the planning stage of a greenfield industrial park to highlight possible waste exchanges (i.e. industrial symbiosis) between companies. Alternatively, it can be also used in a brownfield EIP to assist in the set-up of industrial symbiosis. It also informs if a similar industrial symbiosis has already been implemented, somewhere. A list of references (sheet 3) is indicated for more information.

RECP Monitoring Tool

Tool objective:	Monitor and report the resource savings and results of RECP assessments accomplished in industrial parks. It can be used immediately after RECP assessments to inform about expected results, or later to report about implementation and actual results.
Steps in tool application:	<ol style="list-style-type: none"> 1) Fill in form for RECP results per company in industrial park. 2) Summary of RECP results at company level. 3) Summary of RECP results at industrial park level.
Explanatory notes:	If the project covers multiple industrial parks, additional fill-in forms (worksheets) can be created (one fill-in form per industrial park).

Industrial Synergies Monitoring Tool

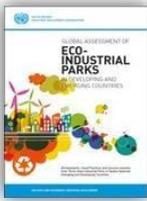
Tool objective:	Monitor and report resource savings, improvements, and impacts in industrial parks achieved through industrial synergies (e.g. by-product, utility, supply chain, service synergies).
Steps in tool application:	<ol style="list-style-type: none"> 1) Monitoring worksheet to fill in the savings and impacts achieved. 2) Summary of savings and impacts of EIP projects, calculations and summary based on completed monitoring worksheet (Summary is automatically generated).
Explanatory notes:	If the project covers multiple industrial parks, additional fill-in forms (worksheets) can be created (one fill-in form per industrial park).

Examples of tool applications to date

<p>EIP Selection Tool</p>	<p>Application and customisation of the EIP Selection Tool Short to review and support the selection of industrial parks to participation in the Global EIP Programme (e.g. Peru, Colombia, Vietnam, Colombia)</p>	
<p>Stakeholder Mapping Tool</p>	<p>Assessment of stakeholder awareness in Morocco for recruitment of companies in UNIDO EIP Pilot Project (2017-18).</p>	
<p>EIP Policy Support Tool</p>	<p>Review of existing government policies and strategies in Colombia as part of the preparatory phase of the Global EIP Programme in the country (2019).</p>	
<p>EIP Assessment Tool</p>	<p>Assessment of PIMSA's performance against the International Framework for EIPs and subsequent identification and action planning of EIP opportunities. Assessment undertaken as part of UNIDO EIP Pilot Project (2017-18).</p>	
<p>Industrial Symbiosis Identification Tool</p>	<p>Application of the Industrial Symbiosis Identification Tool as part of training on the implementation of EIPs in Viet Nam to park management and governmental officials (Juy 2018).</p>	
<p>RECP Monitoring Tool</p>	<p>Monitoring of RECP results in South Africa during the UNIDO EIP Pilot Project (2017-2018).</p>	
<p>Industrial Synergies Monitoring Tool</p>	<p>Monitoring of results from industrial synergy development in Colombia during the UNIDO EIP Pilot Project (2017-2018).</p>	

Further reading on eco-industrial parks

One key focus area of UNIDO's work on eco-industrial parks at the international level is to support the creation of a common understanding and awareness relating to EIPs and to provide practical guidance to practitioners on how to implement the EIP concept. Recommended reading materials on EIPs are summarised below.

<p>Why?</p>	<p>Why is it important to work on Eco-Industrial Parks?</p> <p>Eco-Industrial Parks: Creating Shared Prosperity and Safeguarding the Environment (UNIDO, 2016) https://issuu.com/recpnet/docs/eco-industrial_parks_global</p>	
<p>Where?</p>	<p>Where do we stand regarding international EIP practices?</p> <p>Global Assessment of Eco-Industrial Parks in Developing and Emerging Countries (UNIDO, 2016) https://bit.ly/2RIag3z</p>	
<p>What?</p>	<p>What do we mean with Eco-Industrial Parks?</p> <p>An International Framework for Eco-Industrial Parks (UNIDO, World Bank Group, GIZ, 2017) https://bit.ly/2AD70kr</p>	
<p>How?</p>	<p>How do we implement Eco-Industrial Parks?</p> <p>Implementation Handbook and Toolbox for Eco-Industrial Parks (UNIDO, 2017, 2018) https://bit.ly/2PNk2fb</p>	
	<p>How to operationalize the International EIP Framework?</p> <p>Practitioner's Handbook for Eco-Industrial Parks – Implementing the International Framework (UNIDO, WBG, GIZ, MTIE, 2018) https://bit.ly/2LWts7M</p>	
	<p>How to do detailed planning of Eco-Industrial Parks</p> <p>Planning for Sustainable Industrial Parks (GIZ, 2015) www.giz.de/network/eid-toolbox</p>	
	<p>How to mainstream Eco-Industrial Parks?</p> <p>Mainstreaming Eco-Industrial Parks (WBG, Kicox, 2016) https://openknowledge.worldbank.org/handle/10986/24921</p>	