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Eco-Industrial Parks as a Framework for Circularity and Efficiency Promotion in Industry

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What is an Eco-Industrial Park?

"An EIP can be defined as a **managed industrial area that promotes cross-industry and community collaboration for common benefits related to economic, social and environmental performance.**

The EIP concept has evolved to address interrelated aspects, including, for example: resource efficient and cleaner production, industrial symbiosis, climate change, pollution, social standards, shared infrastructure, improved management of risks and shared resources, including land and ecosystem services. **An interdisciplinary approach** is required to optimally realise EIPs."



International Framework for Eco-industrial parks (UNIDO, IFC, GIZ)

In short, the EIP concept is about creating more resource-efficient and cost-effective industrial parks which are more competitive, attractive for investment and risk resilient.



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Key benefits of eco-industrial parks

Reduce:

- Procurement costs
- Environmental, economic and social risks
- Use of materials, water, energy
- Waste
- Greenhouse gases
- Resource use
- Pollutants

Increase:

- Competitiveness and profitability
- Attract investment
- Security of resources
- Good-quality jobs
- Workers health and safety
- Access to technologies and finances
- Resilience and business continuity
- Quality of life for communities





Ecoplus' extended park management services to 17 industrial parks in Austria

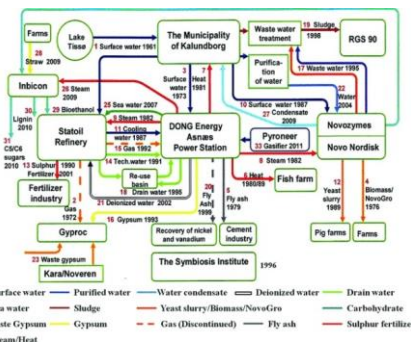
e.g. Investor service hub, industry network creation, research and innovation centres



Community development initiatives in the Kwinana Industrial Area, Australia



EIP concept planning of Parque Industrial Malambo, Colombia



Industrial synergies Kalundborg, Denmark

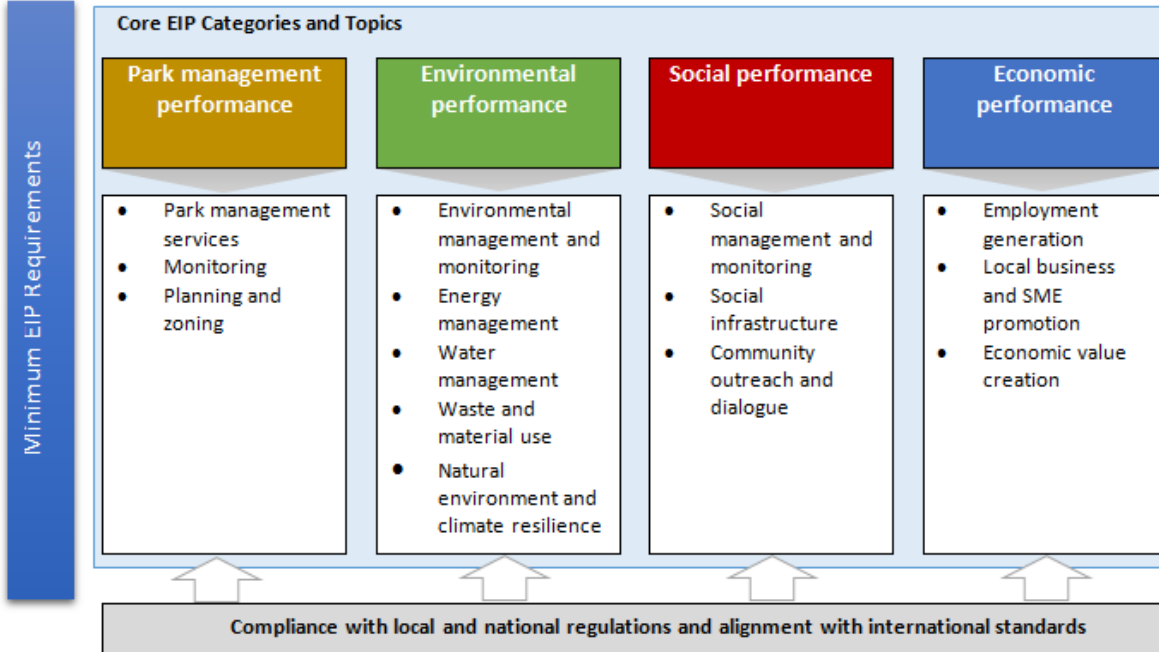


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International Framework for Eco-Industrial Parks

Process of continuous improvement:
Going beyond the minimum EIP requirements



WORLD BANK GROUP

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

UNIDO, World Bank Group, GIZ. An International Framework for Eco-Industrial Parks

<https://openknowledge.worldbank.org/handle/10986/35110>

Question: Who is already familiar with the International EIP Framework?

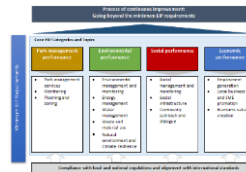


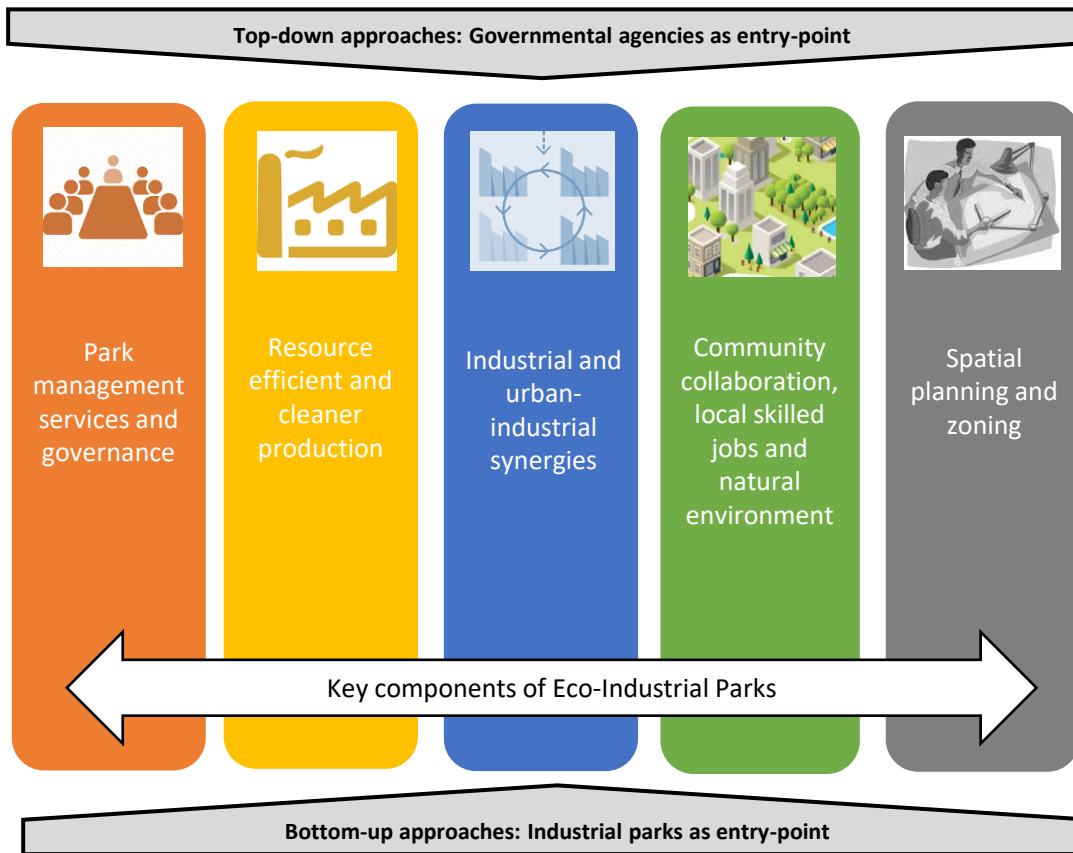
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International Framework for Eco-Industrial Parks Objectives

- Create **common understanding** of Eco-Industrial Parks
- **Identify improvement opportunities**, optimise existing industrial parks
- **Monitor and assess** operational **performance** of existing industrial parks
- Inform **investment decisions, funding** and due diligence studies
- Gain recognition and build **market profile**
- Serve as a practical framework to **support decision making**







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Overview of UNIDO's EIP Tools

Planning tools Park level

EIP Concept Planning Tool

Assist in sustainable design
of an industrial park

Master Plan EIP Review Tool

Guide sustainability review
of existing Master Plan

Implementation support tools Park level

EIP Assessment Tool

Assess park against International EIP
Framework and identify EIP opportunities

EIP Management Services Tool

Strengthen and advance services
provided by park management to tenant
companies

Access to Finance Tool

Identify, review and access available
financing options for feasible EIP
initiatives

Industrial Symbiosis Identification Tool

Support the identification of waste
exchanges between companies

Implementation support tools Country level

EIP Selection Tool

Select parks with high potential for EIP
development and successful EIP projects

EIP Policy Support Tool

Support EIP policy development and
implementation processes

Monitoring tools Park level

RECP Monitoring Tool

Monitor and report results of RECP
assessments in industrial parks

EIP Opportunities Monitoring Tool

monitor and report impacts from EIP
opportunities in industrial parks

Question: Who is already familiar with some tools?

UNIDO's EIP Toolbox is available online:

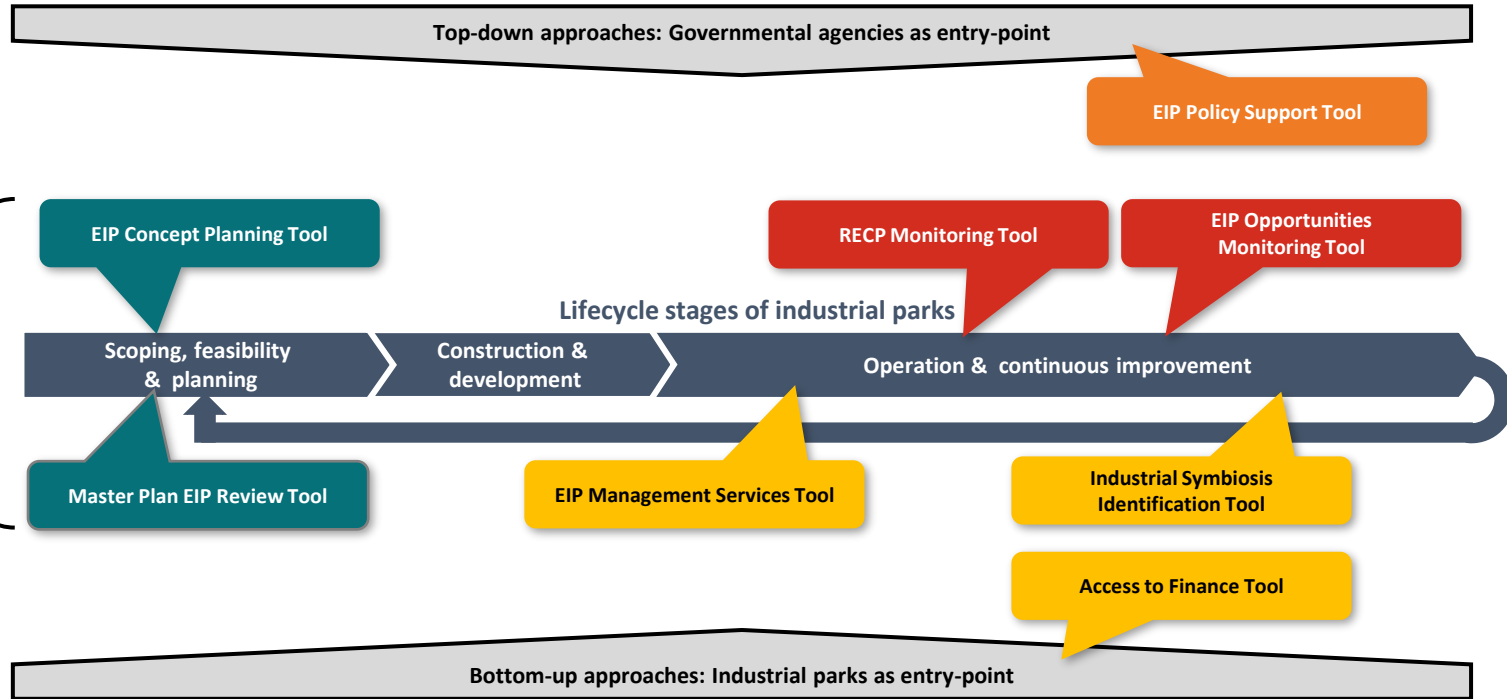
<https://hub.unido.org/eco-industrial-parks-tools>



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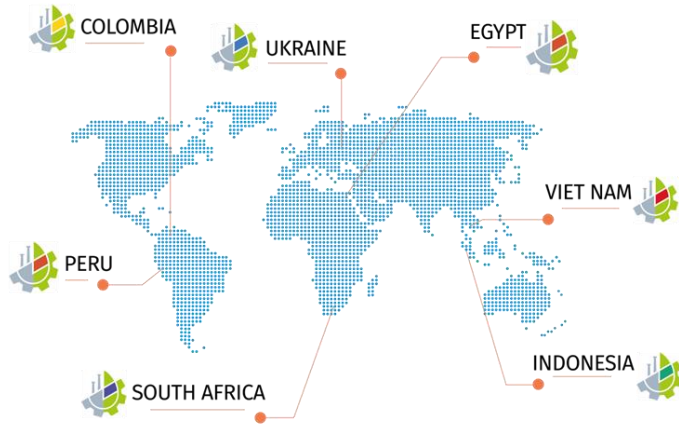


CONTRIBUTION OF TOOLS TO EIP TRANSFORMATION PROCESSES





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GLOBAL ECO-INDUSTRIAL PARKS PROGRAMME (GEIPP)

COMPONENT 1: COUNTRY-LEVEL INTERVENTIONS



COMPONENT 2: GLOBAL KNOWLEDGE DEVELOPMENT



OUTCOME 1
EIP mainstreamed in
relevant **policy** and
regulations



OUTCOME 2
EIP approaches
implemented in
pilot EIPs

Lessons learnt

International
experiences



OUTCOME 3
EIP **tools developed**,
capacity enhanced and
lessons learnt
effectively exchanged

Standardisation
(international collaboration)

Dissemination



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GEIPP Lessons Learnt Series Reports and Best Practice Series



UNIDO's EIP Resources are available online:
<https://hub.unido.org/eco-industrial-parks-tools>



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2. EIP Feasibility Assessments Brief Overview

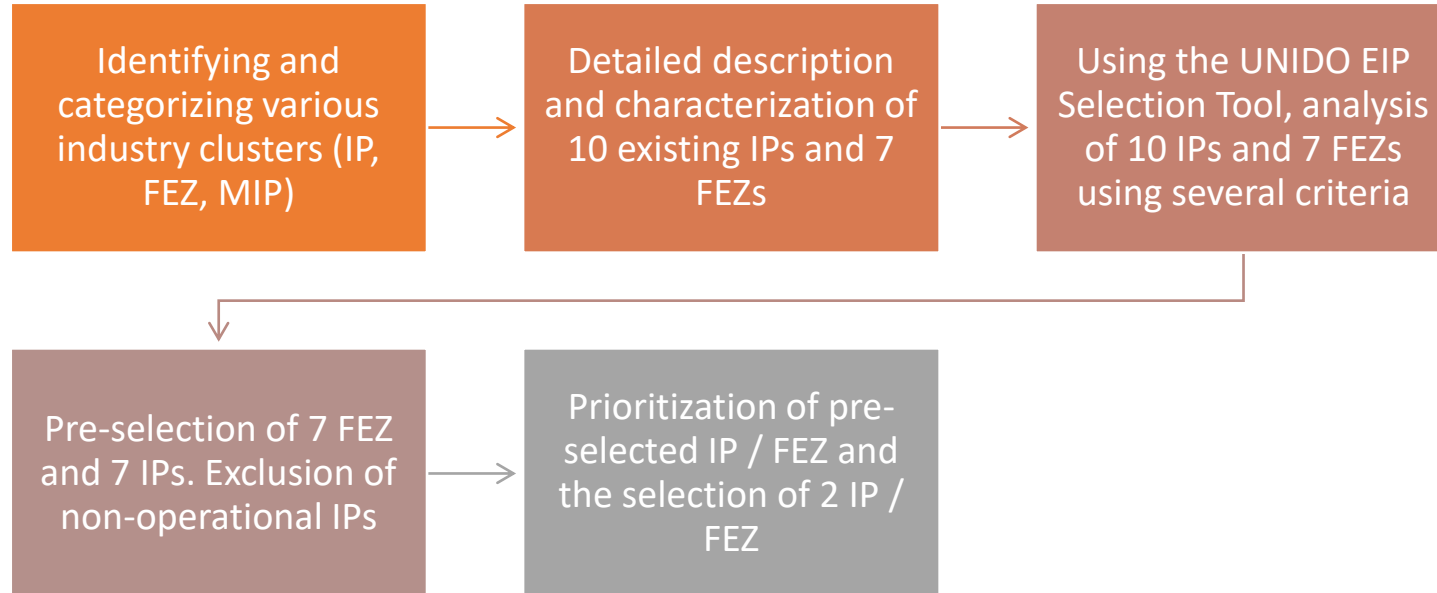


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EIP Feasibility Assessment in Moldova

Selecting two IPs/FEZs





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Industrial Parks/FEZs

Categorisation Criteria – Baseline Understanding all the IPs/FEZs



Name of IP/FEZ



Type of Park



Total Size



Occupancy Rate



Greenfield/Brownfield



Park ownership



Number of companies



Percentage of SMEs



Number of workers



Industrial Sectors



Challenges for the IP



Opportunities for the IP



Needs of the IP



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EIP Feasibility Assessment: 2 IPs/FEZ



Undertaken by international experts



Assess the IPs performance against various indicators and the criteria for: Park Management, Environmental, Social & Economic impacts



Assess gaps and opportunities for improvement



Identify opportunities for IS and RECP on the IP/FEZ through interactive, collaborative workshop



Provide a work-plan and a roadmap for implementing EIP



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Review of IP Tracom against the international EIP framework

Of the 64 indicators
(EIP framework v3), IP
Tracom currently

- Meets (Yes) 23 indicators,
- Does not meet (no) 39 and are
- Considering/yet to confirm 2 indicators.



***Intended performance
of IP Tracom (based on
achievability, benefit
and interest)***

- Meet (Yes) 38 indicators
- Not meet (no) 22 indicators
- Yet be considering 4 indicators.

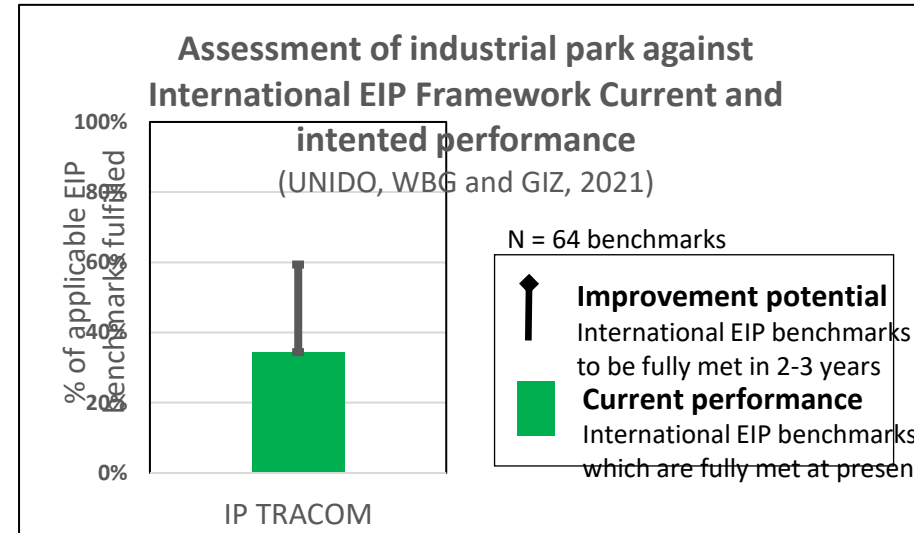
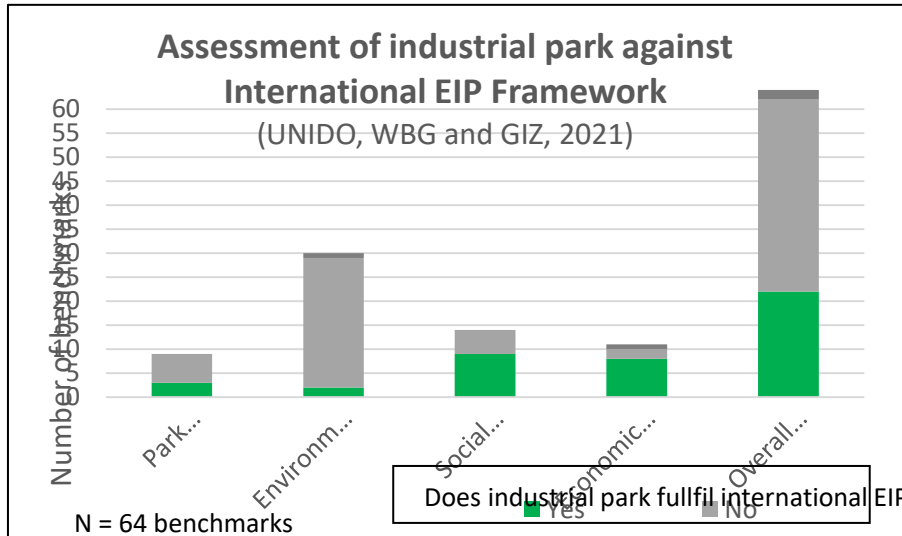


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IP Tracom

Summary of EIP assessment





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EIP Priority Opportunities - Summary

7 of the identified 16 opportunities were identified as 'high priority', based on:



Ease of
implementation (low
hanging fruit)



Highly important/
significant Savings



Low cost or high
potential of return on
investment



High priority for the
Industrial Park
(including compliance)



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EIP Opportunities Identified as 'high priority' Highlights

- **Park Management**

- **Monitoring and risk management**

- **Creating a legal register** outlining main laws related to Industrial Parks -including what an IP must do as well as for residents – focusing on their duties and responsibilities. IP to develop a short communication policy

- **Park management (Performance Indicator)**

- **Contracts with tenants need amendment** to ensure tenants are made responsible and liable for **legal obligations such as waste, water, energy use**, etc. IP administration to also create a "Park - Code of Conduct" to supplement the contract. This could be a medium-term plan so as to not cause huge changes for tenants who have been facing negative impacts of pandemic and war



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EIP Opportunities Identified as 'high priority'

Highlights

- **Environment**

- **Management and monitoring (updated records on energy, water, waste products, and materials inefficiencies and needs at tenant firms)**
 - IP administration to **record energy** (per unit e.g., tonne of product or number of employees) tied with other environmental data such as waste (type and volume per company to check on Industrial Synergy), water use and discharge (as well as quality). The local companies in Digital Hub could support too e.g., in remote monitoring of energy, creating tools to monitor and measure waste
- **Waste and material use (waste and hazardous waste)**
 - Ensure **sufficient and suitable clauses in agreements** (between IP and tenants) on waste management including hazardous waste. If agreements cannot be modified, include them in 'code of conduct'. Furthermore, ensure that the sub-tenants of the park's tenants have equal liability and responsibility on waste management.

EIP Opportunities Identified as 'high priority'

Highlights

- **Environment**
 - **Energy (firm-level energy consumption is monitored)**
 - **Energy used by individual tenants/firms should be monitored** corresponding to consumption or production e.g., turnover, production volume, employees, etc. This is recommended since it allows the IP and tenant companies to understand energy use against a baseline.
 - **Water supply and wastewater (Industrial wastewater generated is treated in accordance with appropriate environmental standards)**
 - **Water discharge to be strictly monitored** and companies that exceed national legal norms to comply by ZLD, CETP, WWTP. IP should consider investing in a Secondary or tertiary WWTP that can support reuse on site



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EIP Opportunities Identified as 'high priority'

Highlights

- **Social**
 - **Social infrastructure (Surveyed employees report satisfaction with social infrastructure)**
 - Develop a **satisfaction survey** that can be used as a template by all tenants
- **Economic:**
 - None in high priority



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4. Barriers and Drivers to EIP



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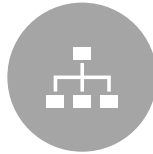


Drivers and motivators to EIP in Moldova

Experiences shared by IP Tracom and FEZ Valkanes



**Attractive for
investment**



Structured programme
to organize
sustainability of the
industrial cluster



Provides a concrete
action plan for
medium and long term



Inclusive of both
tenants and
administrators



Has already started
creating ideas for
sustainability
(environmental, social,
economic)



Reduce costs and
improve efficiency
(with concrete
examples)



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Drivers and motivators to EIP in Moldova

RECP and Industrial Synergies

- **Resource Efficient & Cleaner Production**

- Improved energy grid and power lines for better efficiency in IP Tracom
- New machinery for construction mesh – less energy; less waste
- Smart meter for one company – planning to be extended across the IP, including other IoT solutions
- Solar PV on rooftop
- ‘Waste’ now being used as secondary resource (e.g. pea skin extract as animal feed or compost, or “waste” core product sold to second hand markets)
- Plus many more in early stages of development...



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Drivers and motivators to EIP in Moldova

RECP and Industrial Synergies

- **Industrial Synergies**

- Combining expertise of 2 digital/IT companies to develop smart solutions for sustainability data that could help increase efficiency up to 30-40%
- Waste limestone from one company (outside the zone) used to line the uneven floor for another company, strengthening the surface during rains
- Shared weighbridge facilities
- And others under discussion...



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Barriers to EIP in Moldova

- Need specialized laws or by-laws on
 - Resource use
 - Carbon and energy management
 - Waste management
 - Water use and discharge
 - Cleaner production
 - Sustainable Industrial development
- Clearly relay the duties and responsibilities of IPs and industries
- Relevant infrastructure to facilitate EIP (e.g. waste, water..)
- Stronger contracts providing relevant roles, responsibilities, duties and authorities to administration and tenants
- Identifying and assigning implementing, operating and managing agencies
- Ongoing improvement – NOT a one-off plan



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5. Next Steps



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EIP and Sustainable Industries

The Future?

- ***Industries and sustainability*** and closely linked as one impacts the other
- Need ***stronger action***, especially in emerging economies, to ensure strong growth of enterprises, increase jobs and improve economy, while ensuring sustainability principles
- Remember:
 - Growth does not come at the cost of sustainability → and sustainability will not come at a cost of growth.



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Thank you!

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UNIDO

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