An international framework for Eco-Industrial Parks

Geneva Forum for Sustainable Infrastructure

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An international framework for Eco-Industrial Parks

Joint work

Time-line of collaboration

2013 2014 2015 2016 2017
Global context

- Industrial parks are **key business infrastructures**; their **sustainability and inclusiveness** matter.

- Being infrastructures where firms cluster and conglomerate, industrial parks create favorable conditions for **promoting circularity** within their boundaries and with areas outside.

- Countries and industrial park stakeholders are increasingly requesting **“standards”** or **“benchmarks”** to ensure that industrial development is inclusive and sustainable.

- Industrial parks are known by different names such as industrial areas, zones and estates, industrial investment regions, special economic zones, technological or manufacturing zones, and similar.

- UNIDO, WBG, and GIZ have been supporting governments, industrial park promoters and practitioners in the development and transitioning of Eco Industrial Parks and current joint work builds on this experience.
Rationale for an international framework

• International experience demonstrates that the EIP concept is a valid and sustainable approach to ensure environmental protection and socially fair and responsible business practices in existing and new industrial parks.

• Practice does not yet match the ambition; barriers and market failures exist; there’s potential to leverage best-in class examples.

• Having an EIP assessment framework and performance criteria are important; because they can assist with:
  ➢ Public and Private sector decision making
  ➢ Performance improvement
  ➢ Funding allocation
  ➢ Better use of resources
  ➢ Marketing advantages
  ➢ Reputational benefits
Aim and scope of the Framework

Aim

The international framework for EIP aims to:

i. Assist relevant stakeholders in developing new EIP and transitioning to EIP;

ii. Consistently approach, encourage, and recognize EIP; and

iii. Improve performance, sustainability and inclusiveness of the industrial sector, and move towards an international standard/benchmark for EIP.

Scope

i. The framework adopts an inclusive approach (greenfield and brownfield, developed, transition, and developing economies, all types and sectors) and provides a common understanding of EIP to assist stakeholders.

ii. Given the diversity of industrial parks, and the regulatory regimes in which they operate, sensitivity to local circumstances in the application of the framework is advised.
A common understanding of EIP

Combinations of related EIP terminology used internationally

Eco Sustainable Low Carbon Green Circular

Industrial (Special) Economic Technological Investment Manufacturing

Park Zone Area Cluster Estate
Process of Continuous Improvement:
Going Beyond the EIP Performance Requirements

Core EIP Categories and Topics

- **Park management performance**
  - Park management services
  - Monitoring
  - Planning and zoning

- **Environment performance**
  - Environmental management and monitoring
  - Energy management
  - Water management
  - Waste and material use
  - Natural environment and climate resilience

- **Social performance**
  - Social management and monitoring
  - Social infrastructure
  - Community outreach and dialogue

- **Economic performance**
  - Employment generation
  - Local business and SME promotion
  - Economic value creation

Compliance with local and national regulations and alignment with international standards
Regulatory compliance

- Compliance with national and local regulations is an absolute requirement for all industrial parks, regardless of their specific geographic location and characteristics.

<table>
<thead>
<tr>
<th>National regulations on Environment</th>
<th>National regulations on Social aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Air emission limits (e.g. SOx, NOx, particulate matter)</td>
<td>• Labor laws/regulations (e.g. working hours, child labor)</td>
</tr>
<tr>
<td>• Water discharge limits (e.g. heavy metals, COD, BOD, pH)</td>
<td>• Occupational Health and Safety (e.g. protective clothing and equipment, safety features of machines)</td>
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<tr>
<td>• Waste management (e.g. labeling, storage, contaminants, treatment requirements, hazardous waste handling restrictions)</td>
<td>• Human rights (including women rights)</td>
</tr>
<tr>
<td>• Noise limits (e.g. maximum and ambient noise levels in decibels)</td>
<td>• Protection of indigenous people (e.g. traditional, tribal and other land-connected people)</td>
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<tr>
<td>• Protection of natural environments and biodiversity (e.g. sensitive marine environments, native forests, flora and fauna)</td>
<td>• Anti-corruption (e.g. access to information, accountability, bribery, conflict of interest)</td>
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<td>• Violence and crime prevention (e.g. cybercrimes, theft, violence against women, children, elderly)</td>
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Defining performance requirements for EIP

- Achieving a balance between meaningful and achievable EIP performance requirements is important for implementation in developing countries and transition economies.

- The EIP framework requirements include both prerequisites (qualitative) and performance requirements (quantitative).

- In identifying the topics necessary to constitute an Eco-Industrial Park, careful consideration was given to the following:
  - Going beyond national compliance standards (compliance plus)
  - Addressing key environmental and social requirements
  - Focus on impact areas that can be controlled or influenced by the park’s management, and not with higher level governance institutions/structures
  - Practicality of topics and feasibility of implementation
  - Alignment with competitiveness requirements
# EIP Park management

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Topics</th>
<th>Sub-topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisites (Yes/No)</td>
<td>Park management services</td>
<td>Distinct park management entity</td>
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<tr>
<td></td>
<td>Park property, common services and infrastructure to resident firms</td>
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<td></td>
<td>Monitoring and risk management</td>
<td>Monitoring performance and risks (risk monitoring system available)</td>
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<td></td>
<td>Information on applicable regulations and standards (system for tracking compliance available)</td>
<td>Information on applicable regulations and standards (system for tracking compliance available)</td>
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<td></td>
<td>Planning and zoning</td>
<td>Master Plan (available)</td>
</tr>
<tr>
<td>Performance indicators (targets)</td>
<td>Park management services</td>
<td>Empowered park management (100 % of firms have residency contracts, conditions for fee collection for common services, agreed responsibilities in contracts of firms)</td>
</tr>
<tr>
<td></td>
<td>Efficiency and effectiveness of common infrastructure and services (75% satisfaction rate by resident firms)</td>
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<td></td>
<td>Monitoring and risk management</td>
<td>EIP performance and critical risk management (6 monthly reporting on environmental, social, economic performance and critical risk management reports)</td>
</tr>
</tbody>
</table>


# EIP Economic performance

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<tr>
<th>Assessment</th>
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</thead>
<tbody>
<tr>
<td>Prerequisites (Yes/No)</td>
<td>Employment generation</td>
<td>Type of employment (plans for employment generation)</td>
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<tr>
<td></td>
<td>Local business promotion</td>
<td>Promotion of SMEs (allows/promotes SMEs)</td>
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<td></td>
<td>Economic value creation</td>
<td>Market demand for EIP services and infrastructure (feasibility/business plan for green infrastructure services available)</td>
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<tr>
<td></td>
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<td>EIP meets economic interests of government (tracking of targets: domestic/foreign investment, tax revenues)</td>
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<tr>
<td>Performance indicators (targets)</td>
<td>Employment generation</td>
<td><strong>Local employment generation</strong> (60% of employees)</td>
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<td>Type of employment (long-term) (25% of employees)</td>
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<td>Local business promotion</td>
<td><strong>Local value added</strong> (25% of firms procure locally, 90% for park management)</td>
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<td>Economic value creation</td>
<td><strong>Investment ready park for firms</strong> (average percent occupancy rate over 5 years)</td>
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# EIP Environment performance

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<th>Topics</th>
<th>Sub-topics</th>
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</thead>
<tbody>
<tr>
<td>Prerequisites (Yes/No)</td>
<td>Management &amp; monitoring systems</td>
<td>Environment and energy management system</td>
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<tr>
<td>Energy</td>
<td>Environment and energy management system</td>
<td>Energy efficiency</td>
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<tr>
<td>Water</td>
<td>Environment and energy management system</td>
<td>Energy efficiency</td>
</tr>
<tr>
<td>Climate change and natural environment</td>
<td>Air, GHG emissions and pollution preventions</td>
<td>Environmental assessment and ecosystem services</td>
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<tr>
<td>Management &amp; monitoring systems</td>
<td>Management &amp; monitoring systems</td>
<td>EMS/EnMS systems (40% of larger firms)</td>
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<tr>
<td>Energy</td>
<td>Energy consumption (% of combined &amp; firm level %)</td>
<td>Renewable and clean energy (≥ national average %)</td>
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<tr>
<td>Water</td>
<td>Water consumption</td>
<td>Energy efficiency</td>
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<tr>
<td>Climate change and natural environment</td>
<td>Water treatment</td>
<td>Energy efficiency</td>
</tr>
<tr>
<td>Waste and material use</td>
<td>Water efficiency, reuse and recycling</td>
<td>Energy efficiency</td>
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<tr>
<td>Climate change and natural environment</td>
<td>Waste/by-products reuse and recycling</td>
<td>Water efficiency, reuse and recycling</td>
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<td>Dangerous and toxic materials</td>
<td>Waste disposal</td>
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<td>Waste disposal</td>
<td>Flora and fauna</td>
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<td>Air, GHG emissions and pollution prevention</td>
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<tr>
<td>Prerequisites (Yes/No)</td>
<td>Social management systems</td>
<td>Management team (dedicated personnel in park management)</td>
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<td>Social infrastructure</td>
<td>Primary social infrastructure (adequate provisions in master plan)</td>
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<tr>
<td>Performance indicators (targets)</td>
<td>Social management systems</td>
<td>OH&amp;S management system (well function system in 75% of larger firms)</td>
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<td>Grievance management (100% of grievance received by park management addressed within 90 days)</td>
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<td>Harassment response (75% of larger firms have harassment prevention systems)</td>
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<td>Social infrastructure</td>
<td>Primary social infrastructure (satisfaction of 80% employees)</td>
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<td>Industrial park security (100% safety and security issues addressed in 30 days)</td>
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<td>Capacity building (programs for skills, vocational training and development, ( \geq 20% ) women employees benefit)</td>
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<td>Local community outreach</td>
<td>Community dialogue (80% of community members surveyed satisfied)</td>
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<td>Community outreach (2 outreach activities per year)</td>
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EIP Performance assessments
testing of framework underway in on-going projects

China: 2 Industrial parks
Colombia: 2 Industrial parks
India: 4 Industrial parks
South Africa: 2 Industrial parks
Viet Nam (joint): 4 Industrial parks
Peru: 2 Industrial parks
Morocco: 2 Industrial parks
Senegal: 1 Industrial park
Mauritania: 1 Industrial park
Turkey: 4 Industrial parks
Bangladesh: 1 Industrial park
Ethiopia: 4 Industrial parks
Thailand: 3 Industrial parks
Morocco: 2 Industrial parks
Bangladesh: 1 Industrial park
Ethiopia: 4 Industrial parks

UNIDO
WBG
Hoa Khanh Industrial Zone, Vietnam

Environmental performance:
- Centralized wastewater treatment plant of 5,000 m3/day capacity.
- Solid waste: 3,600 tons/month (94% industrial waste), of which 55% is landfilled.
- RECP options achieved annual savings of US$ 500,000.
- Annual savings:
  - Electricity savings: 1,034,300 kWh
  - Solid waste avoided: 2,571 tons
  - Water savings: 6,000 m3
- Next steps:
  - Collaborating with IFC and the University of Ulsan to identify industrial symbiosis options
  - Application of the Framework

- Location: Lien Chieu District in Da Nang City (396 hectares)
- Activities: 168 companies mechanics; assembly; food and seafood processing; forest products processing; construction materials; and electronics.
- Park management: functioning monitoring system but not yet centrally-managed services.
- Social performance: Essential social infrastructure exists in the immediate vicinity; No public or collective transport system
ALEAP Green Industrial Park, Telangana, India

Social performance provisions:

- **Safety & security** - fenced, CCTV cameras, access control for entry & exit gates,
- **Women specific** – creche, health centre, dormitories/rest houses, toilets, training centre
- **Amenities** – drinking water, food kiosks, canteens, bank, ATM,
- **Transport** – shuttles for internal and external connectivity, provisions for truck drivers
- **Recreational and socio-cultural infrastructure**: sports fields, amphitheater/auditorium, landmark area, green/landscaped leisure zones, art/sculptures etc.
Turkey Green Organized Industrial Zones

Economic performance focus:

- Efforts underway on ensuring economic provisions
- Turkish zones are privately owned and operated
- Project put extra emphasis to ensure revenue implications of OIZ framework
- On certain indicators, Turkey performs well (e.g. local employment, skills development programs). Fall short on linkages to local companies.
- Areas where revenue could be generated from EIP activities are:
  - green infrastructure services (recycled/reclaimed water, steam and waste heat, renewable energy, waste management etc.),
  - resource efficiency consultancy (water efficiency assessments, energy efficiency audits etc.) and related research/laboratory facilities,
  - industrial symbiosis networking between tenant firms,
  - tenant resource matching based on their inputs/outputs and material/feedstock needs

- Turkey has around 300 organized industrial zones of different types (mixed use, specialized, private, etc.) home to about 1 million employees
- In 2015, Government approached WB for a comprehensive design of a national EIP framework to spur productivity and sustainability
- Pilot phase included 4 zones for technical analysis (Bursa, Izmir, Antalya, Ankara)
- Project has finalized technical analysis
  - Potential annual cost savings: over $95M.
  - Estimated capital investment: $350M,
  - Payback period of only 3.7 years.
- Next step in implementing green OIZ framework and scaling investments.
Concluding remarks and future prospects

- Eco-Industrial Park development offers an important and integrated approach to drive and scale up efforts by the private and public sectors for inclusive and sustainable industrial development (ISID) and circular business practices.

- UNIDO, the World Bank Group, and GIZ will ensure application of these performance requirements in their projects and programs, and welcome the opportunity to discuss options and available support for EIP with interested stakeholders.

- The development of internationally-accepted standards for EIP is a long-term, multi-stakeholder process. As the authoring organizations, we hope that the framework provided here can serve as an important step in developing an international standard for EIP.

- Given the importance and complexity of this topic, our three organizations intend to refine this framework based on further testing and on-going stakeholder consultations.
Thank you

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