Eco-industrial parks serve as a niche for sustainable low-carbon urban transition in China

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Outline of the presentation

• Background to the research
• Research methodology
• SIP, TEDA and NETDZ as three case studies
• Preliminary findings and future research work
Rising contribution of national industrial parks to China’s economy (2006)

<table>
<thead>
<tr>
<th></th>
<th>54 ETDAs</th>
<th>53 STIPs</th>
<th>National</th>
<th>Rate of NIPs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Regional Product (RMB billion)</td>
<td>1013.7</td>
<td>1204.9</td>
<td>21087.1</td>
<td>10.5</td>
</tr>
<tr>
<td>Industrial Value added (RMB billion)</td>
<td>741.4</td>
<td>852.1</td>
<td>9131.1</td>
<td>17.5</td>
</tr>
<tr>
<td>Export Value (US$ billion)</td>
<td>149.2</td>
<td>136.1</td>
<td>968.9</td>
<td>29.4</td>
</tr>
<tr>
<td>Accumulated FDI Received (US$ billion)</td>
<td>116.2</td>
<td>76.1</td>
<td>673.4</td>
<td>28.6</td>
</tr>
<tr>
<td>Developed Area (km2)</td>
<td>1024.0</td>
<td>455.0</td>
<td>33659.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Jobs (thousand)</td>
<td>4742.5</td>
<td>5737.0</td>
<td>283100.0</td>
<td>3.7</td>
</tr>
</tbody>
</table>
Development process of China industrial environmental regime
Procedure for EIP planning, implementation and nomination in China

--- Stage of EIP planning ---

Industrial parks

- Apply to the National EIP LG Office for becoming a National Trial EIP

- Approved by the LG Office?
  - Yes
    - Make a plan & technical report for constructing a National Demo EIP
  - No
    - End or reapply

- Approved by the technical panel?
  - Yes
    - Approved by MEP, MOC & MOST for being named as a National Trial EIP
  - No
    - Reapply in the future

--- Stage of EIP implementation ---

- Implement the EIP plan & evaluate the annual progress for 3-5 years

- Meeting the EIP criteria?
  - Yes
  - Apply to the National EIP LG Office for being named as a National Demo EIP

  - Approved by the review panel?
    - Yes
      - Nominated by MEP, MOC & MOST as a National Demo EIP
    - No
      - Reapply in the future

  - No
    - Apply to the National EIP LG Office for being named as a National Demo EIP

- Nominated by MEP, MOC & MOST as a National Demo EIP

--- Stage of a National Demo EIP ---

Continue or cease to be a National Demo EIP
Locations of 60 National Trial EIPs & 15 National Demonstration EIPs in China
### 3-level resource optimization of EIPs

<table>
<thead>
<tr>
<th>Level</th>
<th>Intra-firm level</th>
<th>Inter-firm level</th>
<th>Regional level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green investment promotion</strong></td>
<td>Preventing new polluting investment through EIA</td>
<td>Promoting loop-closing new business &amp; cluster</td>
<td>Developing venous (resource-recovery) industry</td>
</tr>
<tr>
<td><strong>Greening existing industries</strong></td>
<td>Promoting cleaner production/eco-design</td>
<td>Synergy between existing companies</td>
<td>Improving regional environmental Infrastructure &amp; EMS</td>
</tr>
</tbody>
</table>
Origin of the research

• Relevant ministries promote the Development of Low Carbon Economy in National Demonstration Eco-industrial Parks.

• Some leading National Demonstration EIPs have been actively experimenting on the low-carbon development solutions.

• Many leading Chinese industrial parks have been rapidly growing into new urban centers.

• Whether and how can leading EIPs become the niche for transition toward low-carbon urban development in China?
Main research questions

• What are the typical low-carbon urban development policy measures and resultant environmental benefits that the EIPs have adopted?
• Who learn what from whom about low-carbon urban development policy?
• What drive and hinder the leading EIPs to pursue low-carbon urban development?
• What are the main barriers to replicate the low-carbon urban development policy in their home cities and in other regions in China?
Research methodology

• Comprehensive review of national policy and other public documents (including eco-industrial park plans, annual implementation reports, and their retrospective assessment reports)

• In-person semi-structured interviews among national environmental policymakers, industrial park officials, specialists producing eco-industrial park plans, and managers working in the three industrial parks

• Policy learning/transfer theory
Low-carbon development policy learning: Who learn what from whom?

Diagram:
- International
- National
- City
- Eco-industrial Park
Disadvantages of environmental management in Chinese industrial parks

• speedy approval of investment projects that gives short shrift to required environmental scrutiny (such as environmental impact assessment) for the investment projects located in industrial parks;

• using industrial parks as buffer zones or so-called “protection umbrellas” for shunning environmental enforcement of polluting enterprises.
Three case studies: BDA, SIP & TEDA
Rational for selecting the three EIPs for case study

• They are all National Demonstration EIPs with aggressive action in low-carbon development.
• They represent different stages of the transition from industrial parks to new urban districts
  – SIP is an industrial park stressing the service and residential functions and integrated land use plan at the very beginning
  – TEDA still focuses on the manufacturing sector with a relatively small residential area.
  – Nanjing ETDZ was recently expanded to an mixed urban district in 2011.
Total Area: 288 km²
For the core area:
29% Industrial use
45% Residential & commercial
26% Green and transportation
总量与增幅保持领先    质量与效益同步提升

1994年 — 2007年

<table>
<thead>
<tr>
<th>指标</th>
<th>1994年</th>
<th>2007年</th>
<th>增幅</th>
</tr>
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<tbody>
<tr>
<td>地区生产总值</td>
<td>836亿元</td>
<td>72.8倍</td>
<td></td>
</tr>
<tr>
<td>地方一般预算收入</td>
<td>76.3亿元</td>
<td>354倍</td>
<td></td>
</tr>
<tr>
<td>进出口总额</td>
<td>568.8亿美元</td>
<td>2274.3倍</td>
<td></td>
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</table>
1、制定并实施了科学的生态建设与保护规划

实现了开发建设规划与环境保护规划全覆盖

- 积极借鉴国际先进理念，编制实施各类专业规划300多项。
A case study on TEDA in Tianjin, China
TEDA as a Salt Pan in 1984
TEDA in 2006
Common features of low-carbon development in EIPs

- Pioneering in introducing and diffusing green building practices (such as LEED certification)
- Aggressively promoting sustainable transportation systems (driven by reducing the commuting pressures)
- Mitigating GHG emissions at the intra-firm, inter-firm, and park levels.
- Leading in deploying clean energy and renewable energy and developing green energy technology
- Emerging low-carbon technology innovation and commercialization hubs
Advantages of low-carbon development in EIPs as compared to their home cities

• More streamlined institutional set-ups leading to better inter-departmental coordination and cooperation

• Endogenous motivations to become attractive and competitive urban centers

• Region-wide ISO 14001 Environmental Management Systems

• Innovation and eager embrace of new ideas and systems as part of their DNAs
Barriers towards low-carbon development in EIPs as compared to their home cities

• Infrastructure system beyond the scope of the industrial parks themselves
• Inability to formulate local legislation to institutionalize the low-carbon development practices
• First-mover disadvantages vs. advantages
Lessons learned from the EIP planning

• EIP plans were mostly initiated and led by the environmental branches of the industrial park authorities.
• The integrative nature of the program makes it difficult to clearly and convincingly demonstrate the causalities of the respective actions.
• They remain primarily public-led initiatives and local industry and community are not actively involved.
• The program has primarily relied on external knowledge and technical expertise.
• There lacks effective funding mechanisms.
Some reflections on previous EIP planning as guidance for more effective low-carbon planning in the future

• EIP as rationalistic, blueprint planning vs. adaptive, continuous planning

• EIP planning as a closed, unitary exercise vs. an open, participatory process

• Align the focus of an EIP plan with the development stage of industrial ecosystems

• EIP planning within vs. beyond the boundary of the industrial park
Further research

- Some leading EIPs have pioneered low-carbon urban development
- Need to decide whether to explore why some other EIPs lag behinds in terms of low-carbon development initiatives through a questionnaire survey