

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

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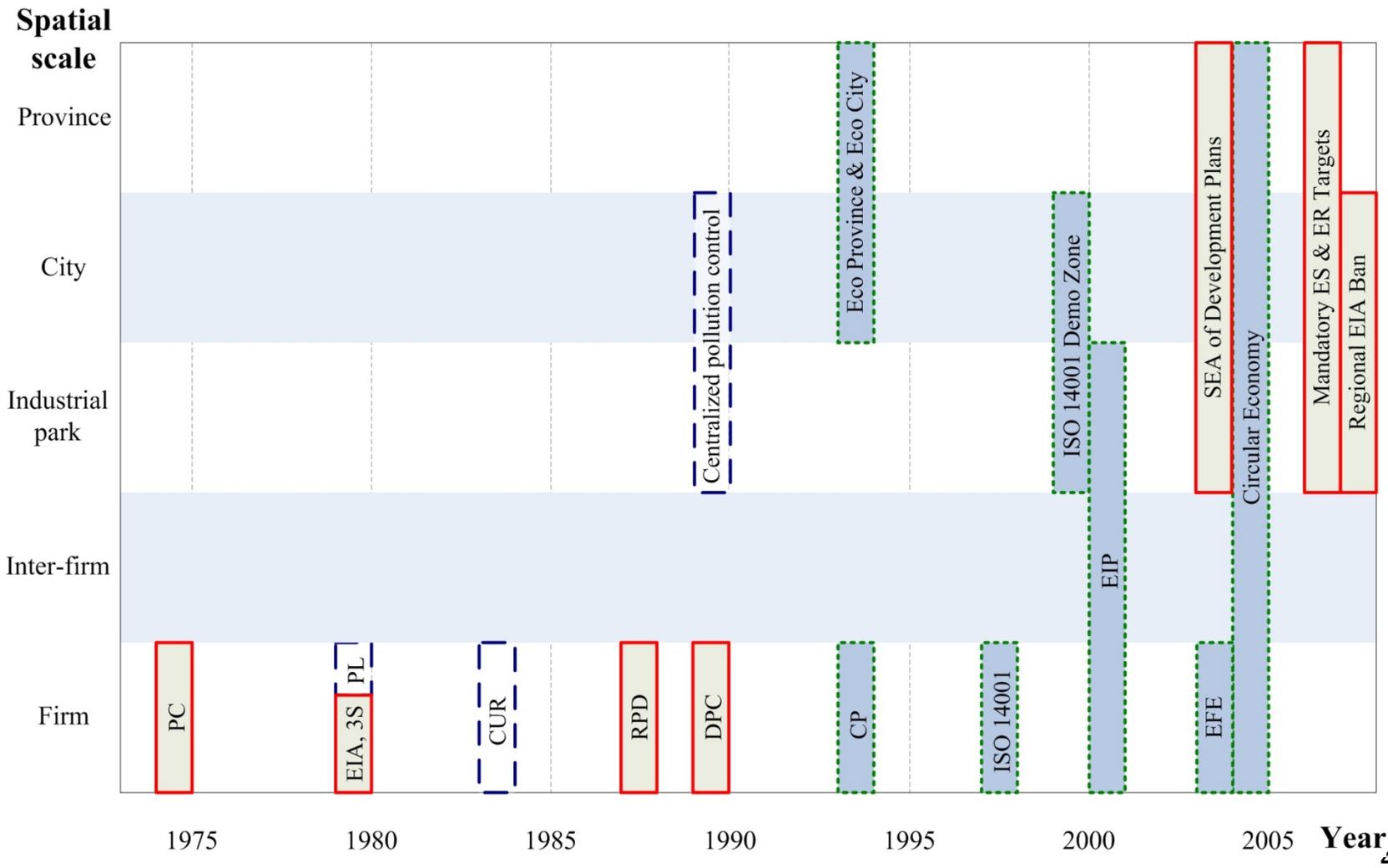
# Outline of the presentation

- Background to the research
- Research methodology
- SIP, TEDA and NETDZ as three case studies
- Preliminary findings and future research work

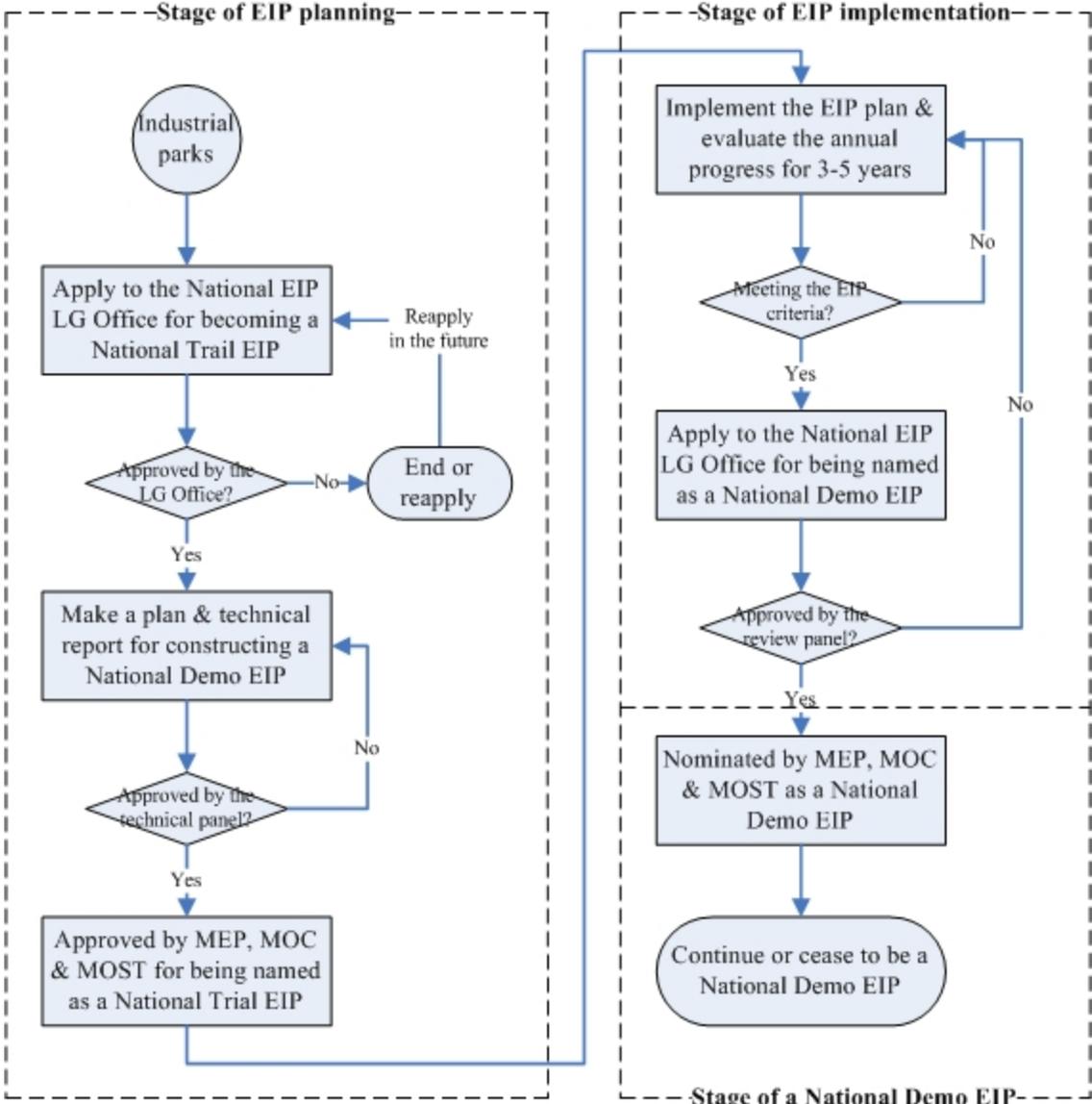
## Rising contribution of national industrial parks to China's economy (2006)

	54 ETDAs	53 STIPs	National	Rate of NIPs (%)
Gross Regional Product (RMB billion)	1013.7	1204.9	21087.1	10.5
Industrial Value added (RMB billion)	741.4	852.1	9131.1	17.5
Export Value (US\$ billion)	149.2	136.1	968.9	29.4
Accumulated FDI Received (US\$ billion)	116.2	76.1	673.4	28.6
Developed Area (km <sup>2</sup> )	1024.0	455.0	33659.8	4.4
Jobs (thousand)	4742.5	5737.0	283100.0	3.7

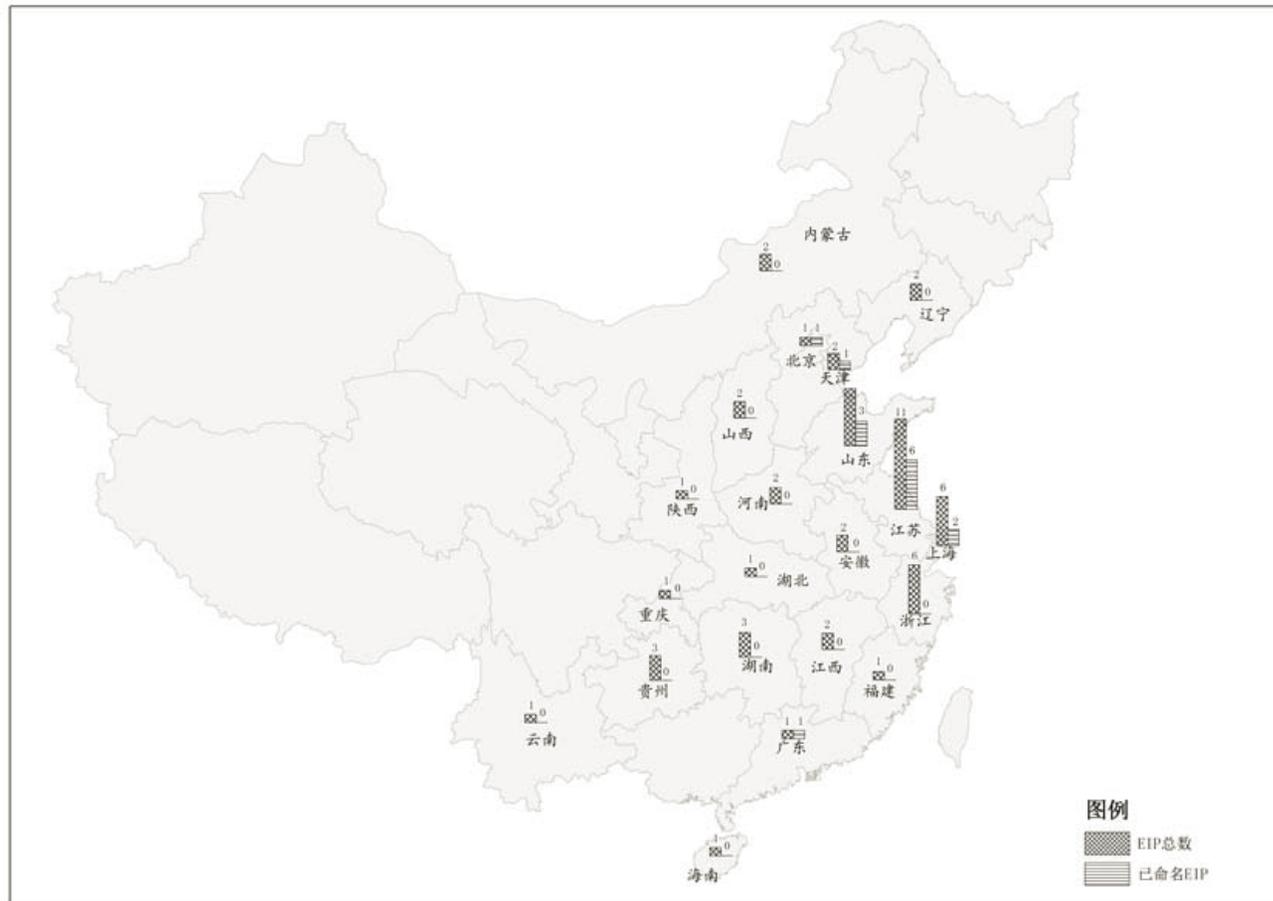
# Development process of China industrial environmental regime



# Procedure for EIP planning, implementation and nomination in China



# Locations of 60 National Trial EIPs & 15 National Demonstration EIPs in China



# 3-level resource optimization of EIPs

	Green investment promotion	Greening existing industries
Intra-firm level	Preventing new polluting investment through EIA	Promoting cleaner production/eco-design
Inter-firm level	Promoting loop-closing new business & cluster	Synergy between existing companies
Regional level	Developing venous (resource-recovery) industry	Improving regional environmental Infrastructure & EMS

# 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?*

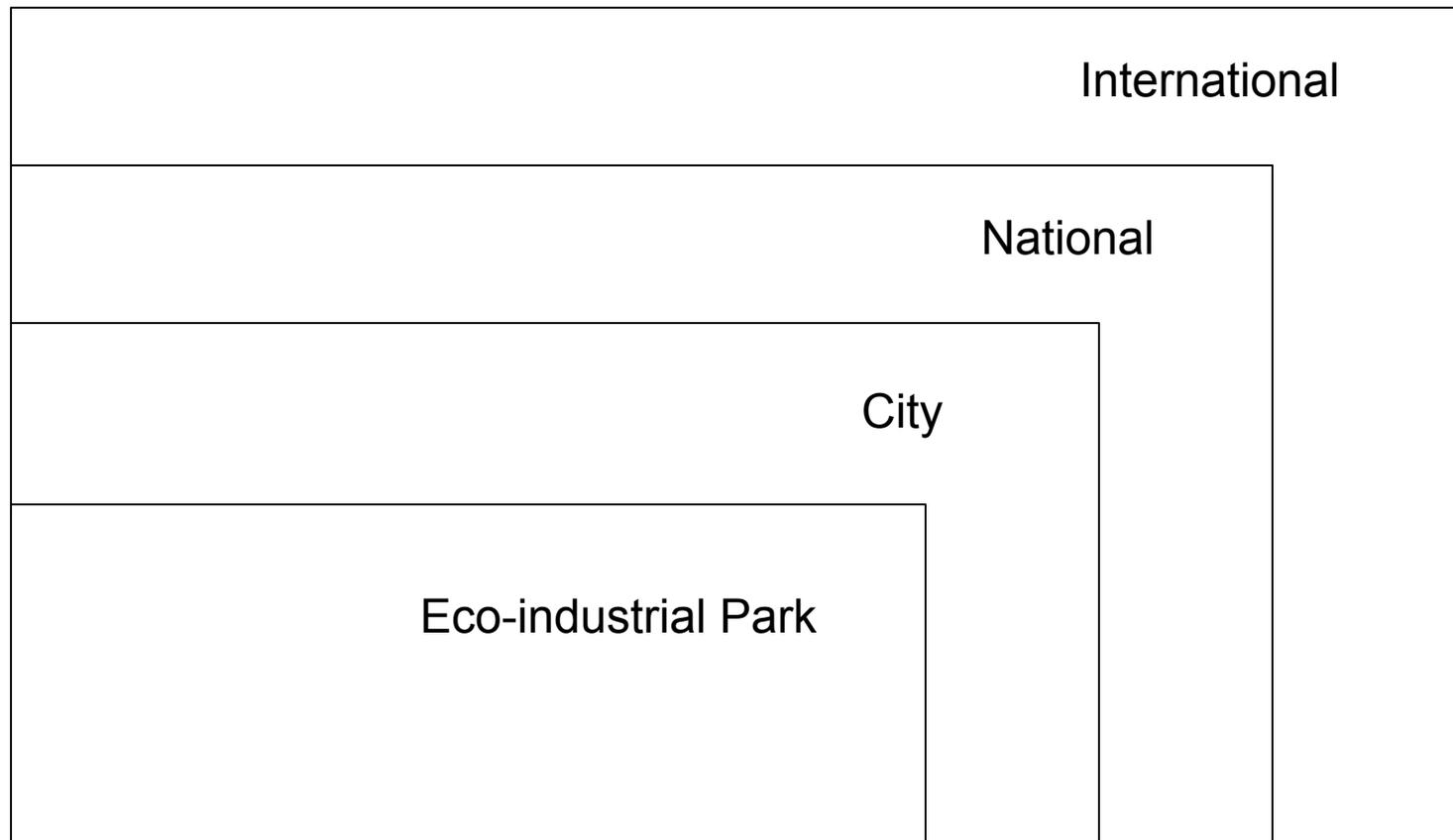
# Main research questions

- 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

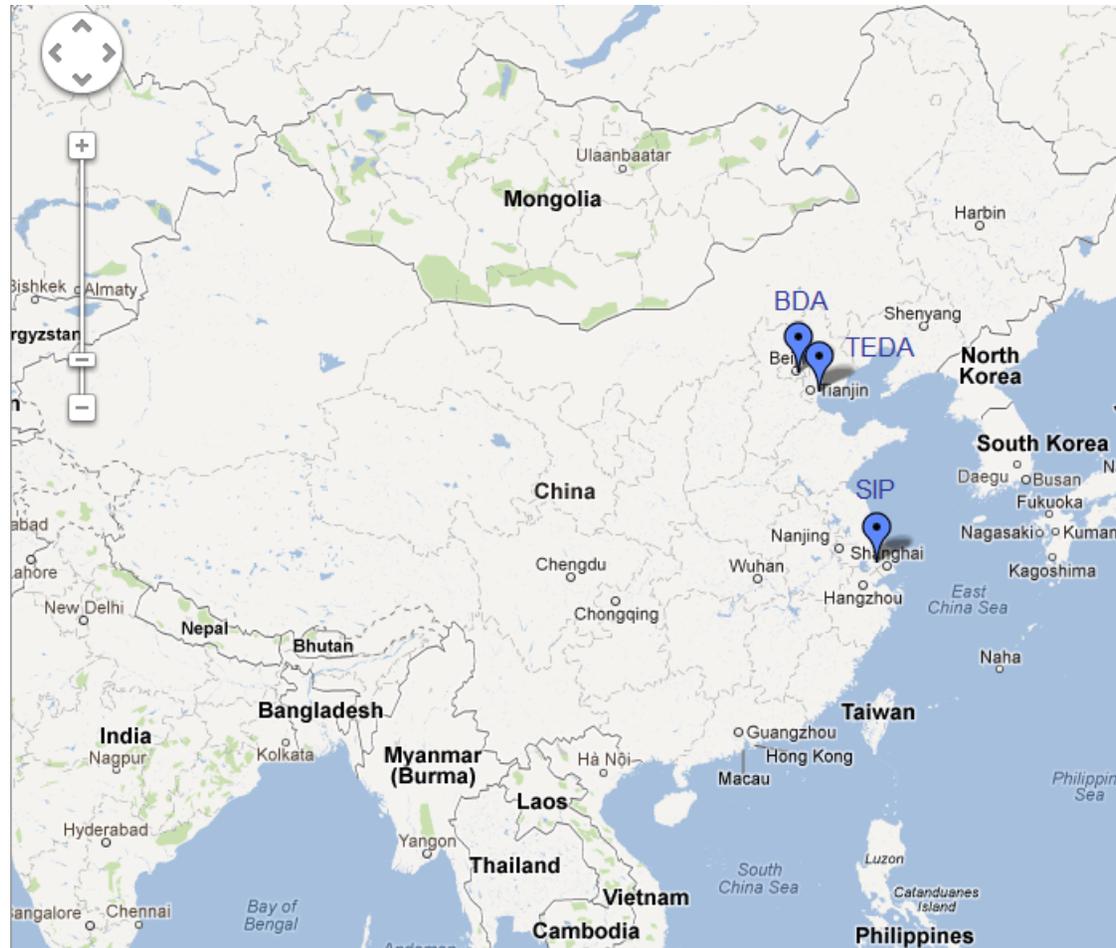
# Low-carbon development policy learning: Who learn what from whom?



## Disadvantages of environmental management in Chinese industrial parks

- speedy approval of investment projects that 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.

# China-Singapore Suzhou Industrial Park

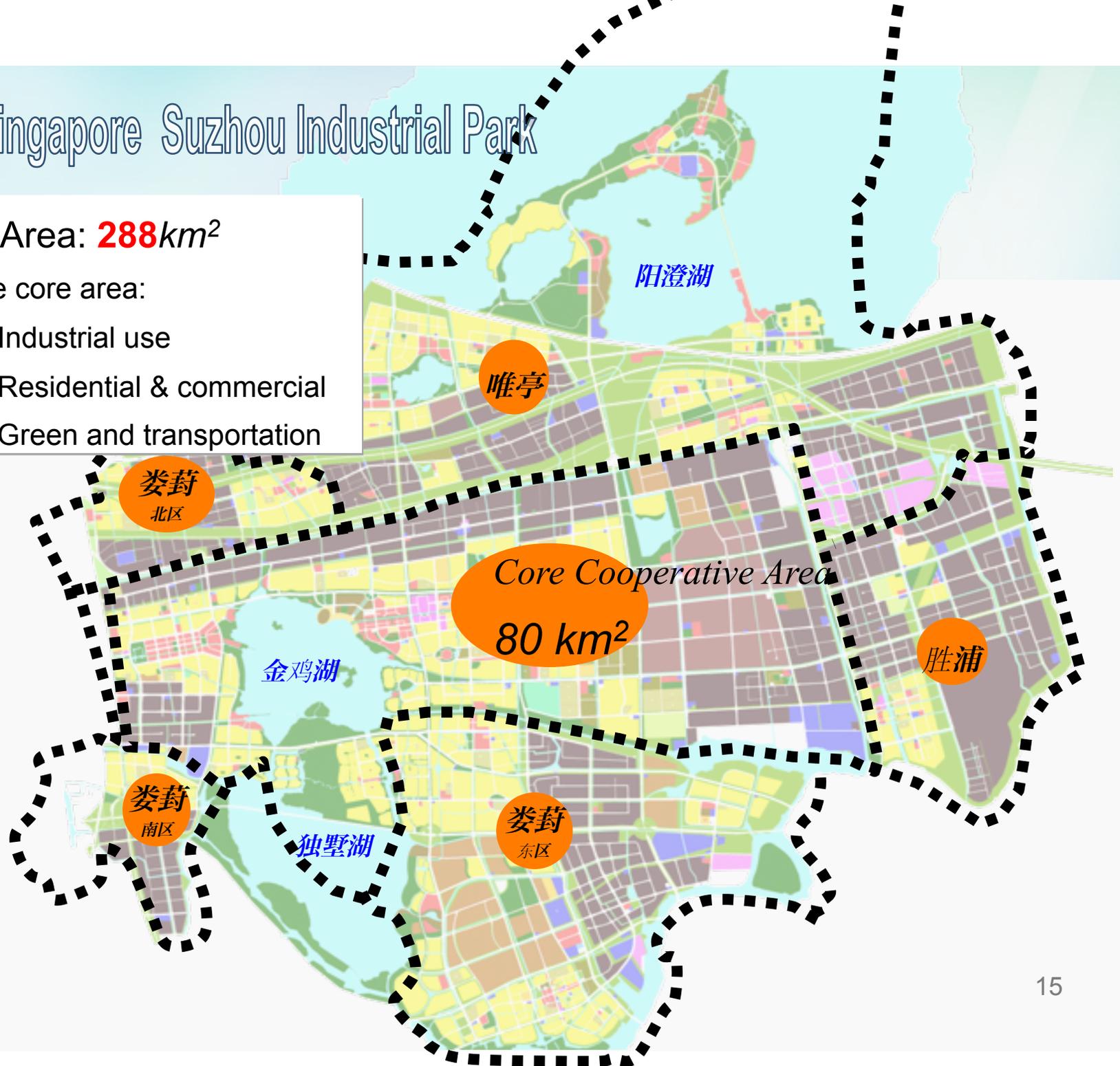
Total Area: **288km<sup>2</sup>**

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

地区生产总值

836亿元



72.8倍

地方一般预算收入

76.3亿元



354倍

进出口总额

568.8亿美元



2274.3倍

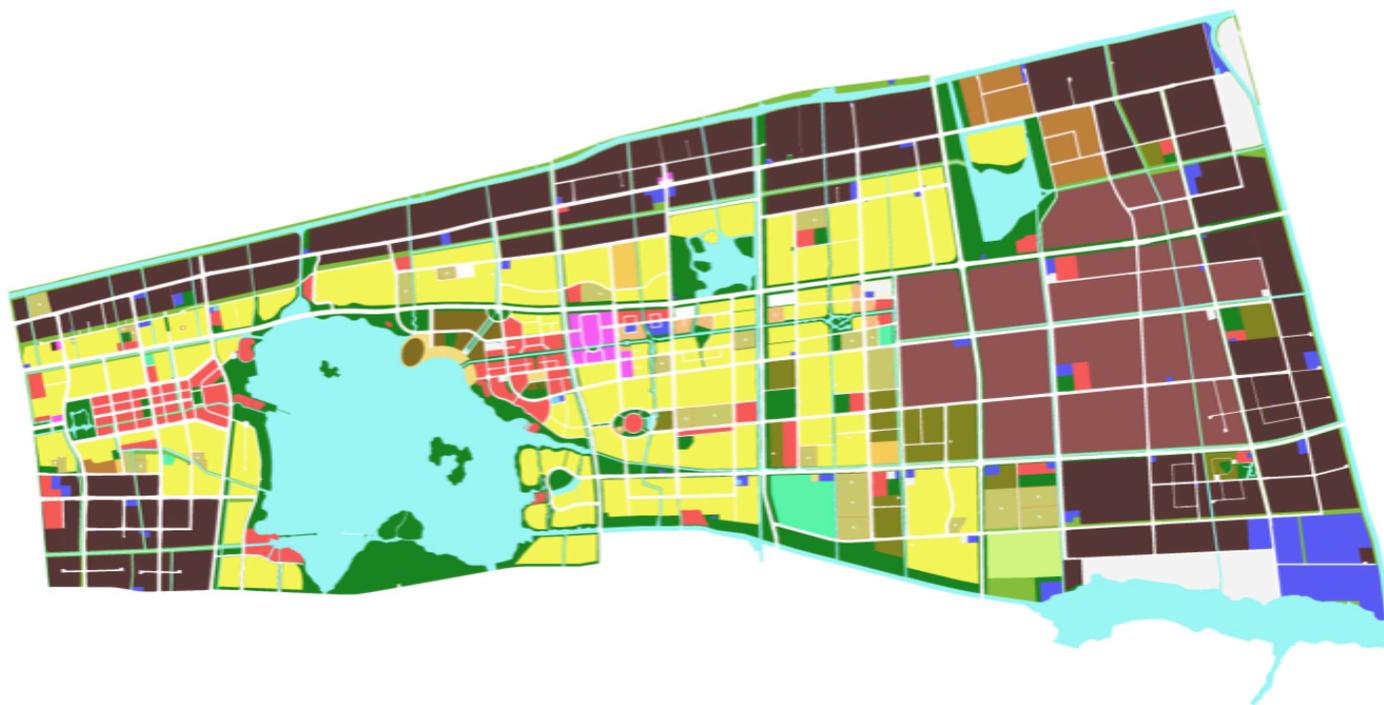


# 1、制定并实施了科学的生态建设与保护规划

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**。

## 苏州工业园区中新合作区总体规划

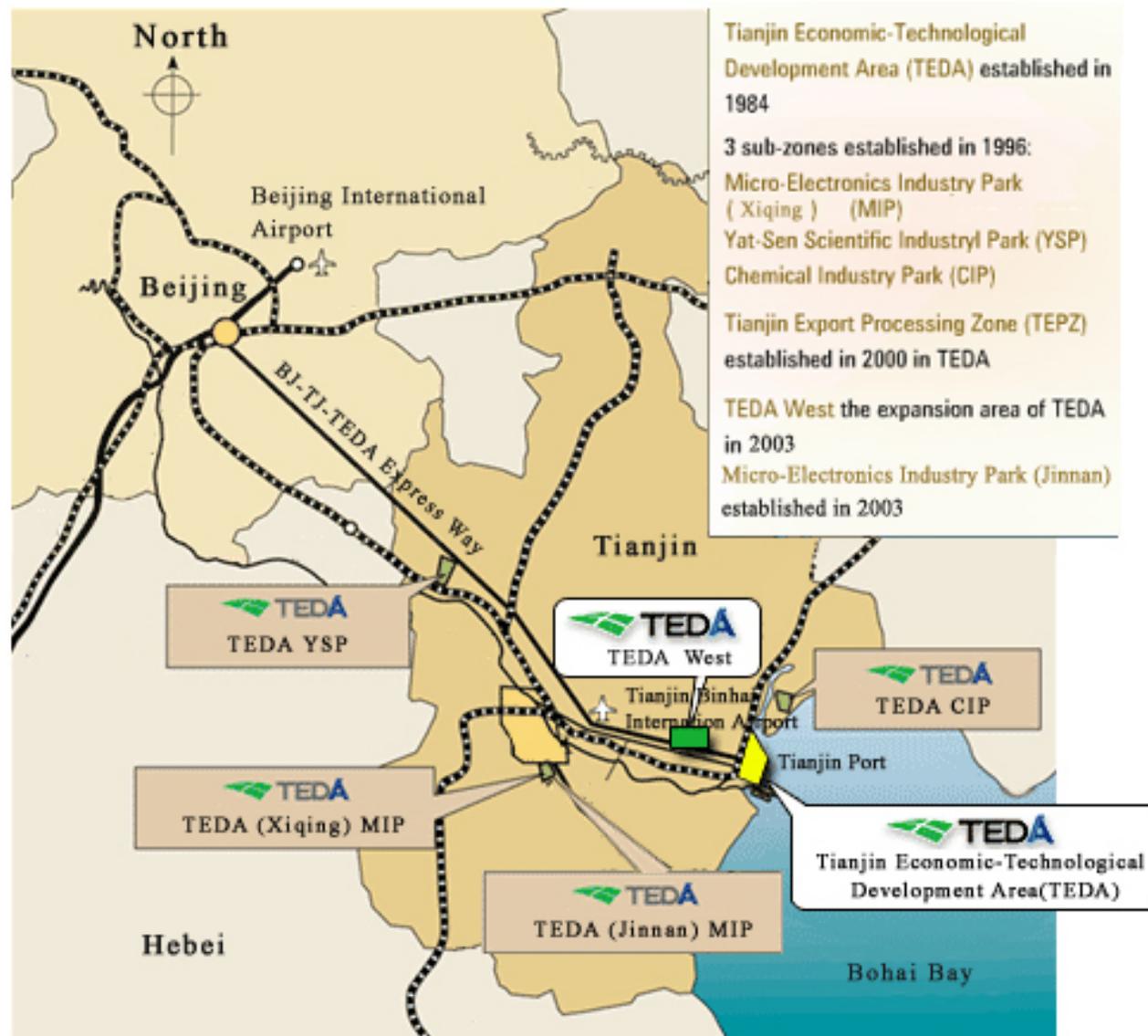


**29%** 产业发展用地（工业、科技、会展、仓储等）

**45%** 居住、商业及公用设施用地

**26%** 市政、绿化及道路交通用地

# A case study on TEDA in Tianjin, China



# TEDA as a Salt Pan in 1984



# TEDA in 2006



Fly ash from Co-gen



Soda slag

Industrial Symbiosis by Novozymes in TEDA

New Soil Source

Novozymes



NovoGro



Land-scaping



Land-scaping

Effluent



Recycling



Road cleaning

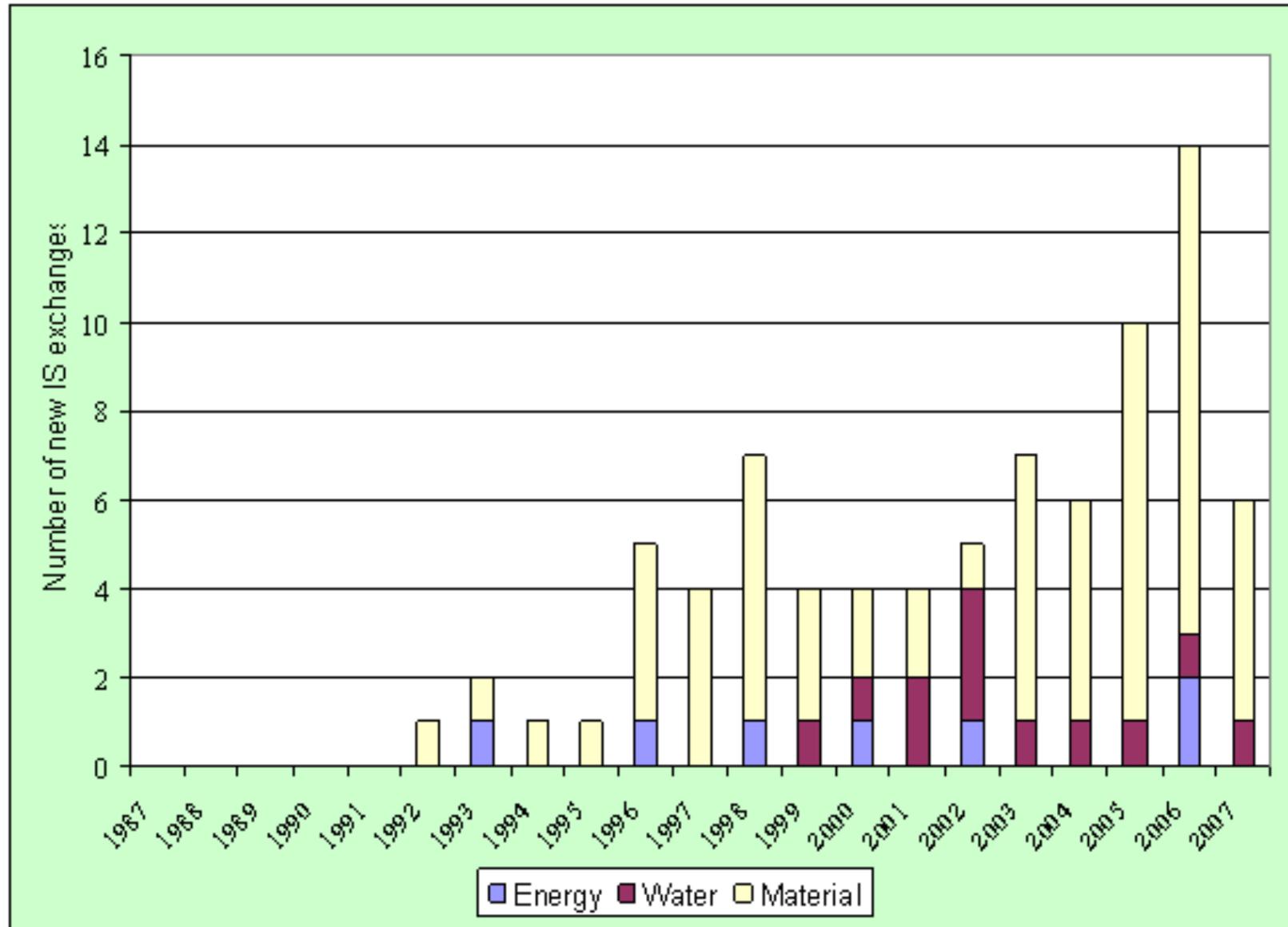


Trimmings



Organic fertilizer

# Evolution of symbiotic exchanges in TEDA



# 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