

# International EID Overview

USEID Networking Workshop

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Re-Tem Corporation, Tokyo

# Worldwide Eco-Industrial Development Initiatives



## 1846: Industrial Town - Eisenheim, Germany





## 1902-1920: Garden City - Margarethenhöhe, Germany





## 1998 - Cape Charles Eco-Industrial Park





## 2030 - Eco-Cities (Masdar) & Vertical Cities



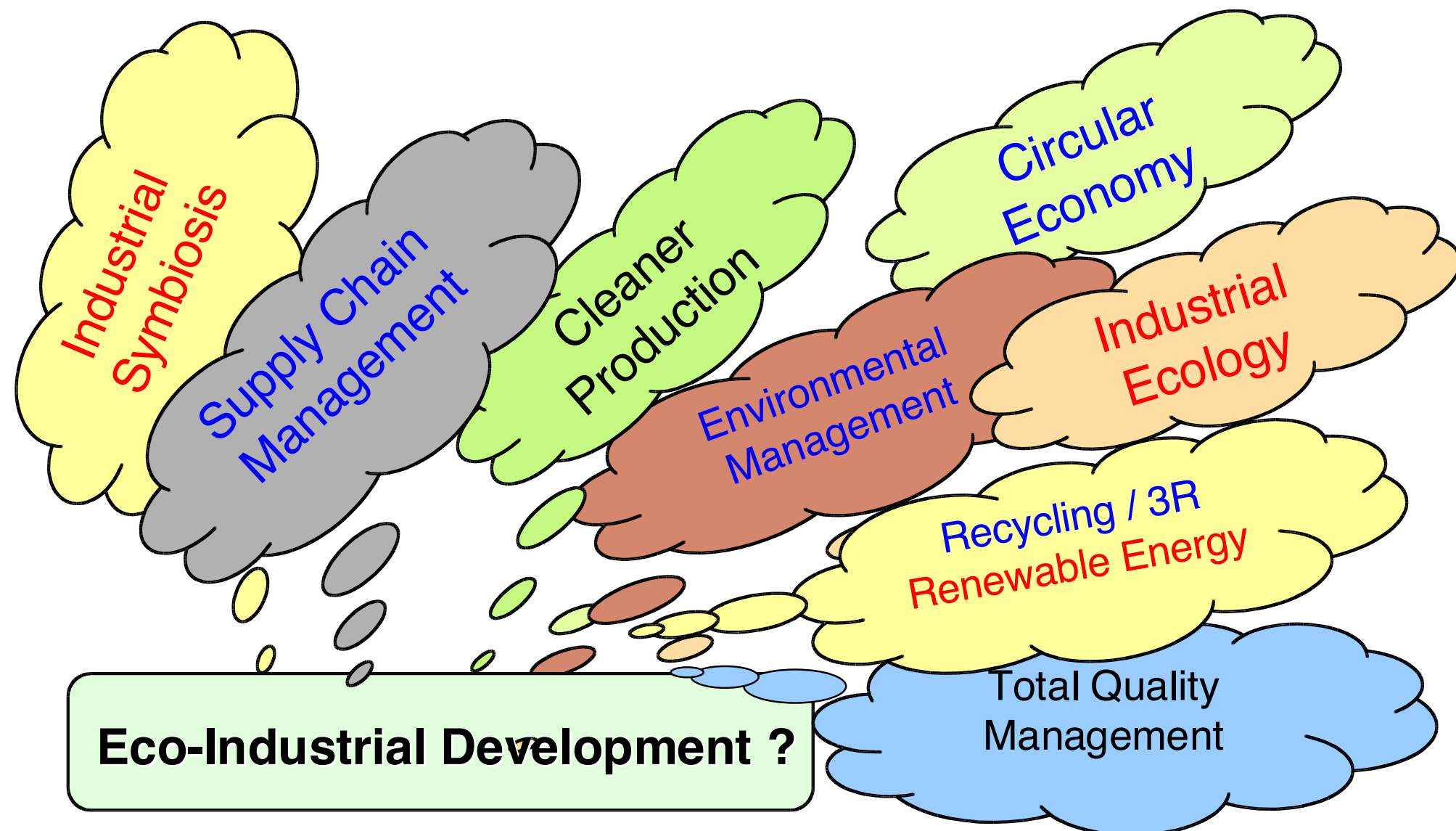
## □ History of Environmental Management Approaches

<b>Principle of Diffusion</b>	<b>1960s</b>	⇒ <b>Policy of 'high smoke stacks', hazardous waste discharge to open sea</b>
<b>End of Pipe Technology</b>	<b>1970s</b>	⇒ <b>Filter, Catalyst, WWTP: development of Environmental Technologies</b>
<b>Closed Loop Economy</b>	<b>1980s</b>	⇒ <b>Recycling of secondary materials, reduction of waste volume, resource efficiency, 'Green Dot'</b>
<b>Cleaner Production</b>	<b>1990s</b>	⇒ <b>Integrated view of production processes, integration of technology and management</b>
<b>Eco-Efficiency</b>	<b>mid 1990s</b>	⇒ <b>Re-designing of production processes, products and markets</b>
<b>Industrial Ecology</b>	<b>mid 1990s</b>	⇒ <b>Synergies by maximum use of resources through the greatest cycling of material and energy</b>



## What is Sustainable Industrial Development ?

- Many approaches to environmental issues require good management practice
- SME mostly lack capacity and knowhow to absorb tools
- Dissemination often based on 'Door-to-Door' approach





## Forms of Eco-Industrial Development

### ❑ Eco-Industrial Park / Estate

- defined area with zoning and boundary
- often dedicated management
- special laws & incentives (national & local)

### ❑ Eco-Industrial Cluster / District

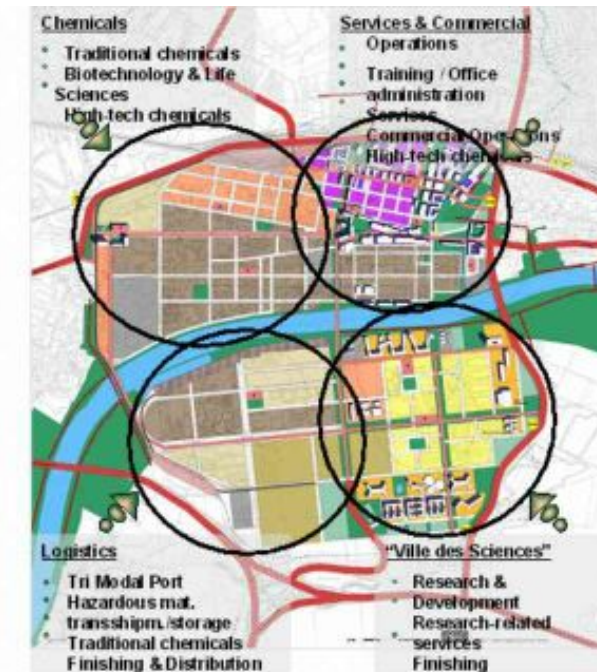
- local (regional) network with close proximity
- usually no management structure
- often Co-Op or Association

### ❑ Eco-Industrial Network

- regional links with few co-locations
- often based on material flow or supply chain
- usually with 3rd party institution (university)

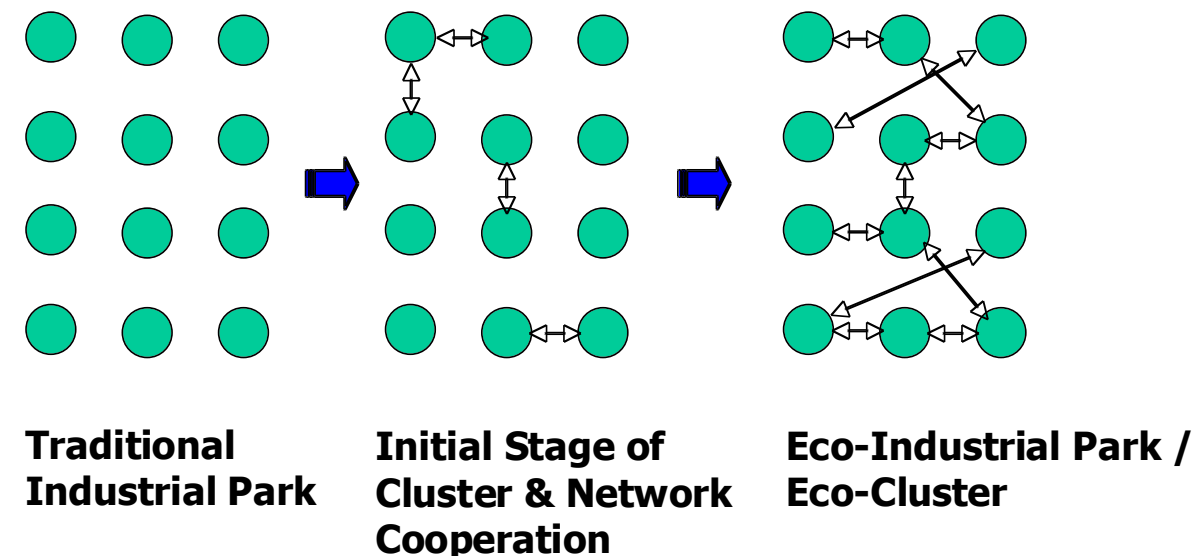
### ❑ Special Purpose Systems

- Resource Recovery Park
- Eco-Town
- Eco-Technology Park
- Biomass-based Cluster
- ....



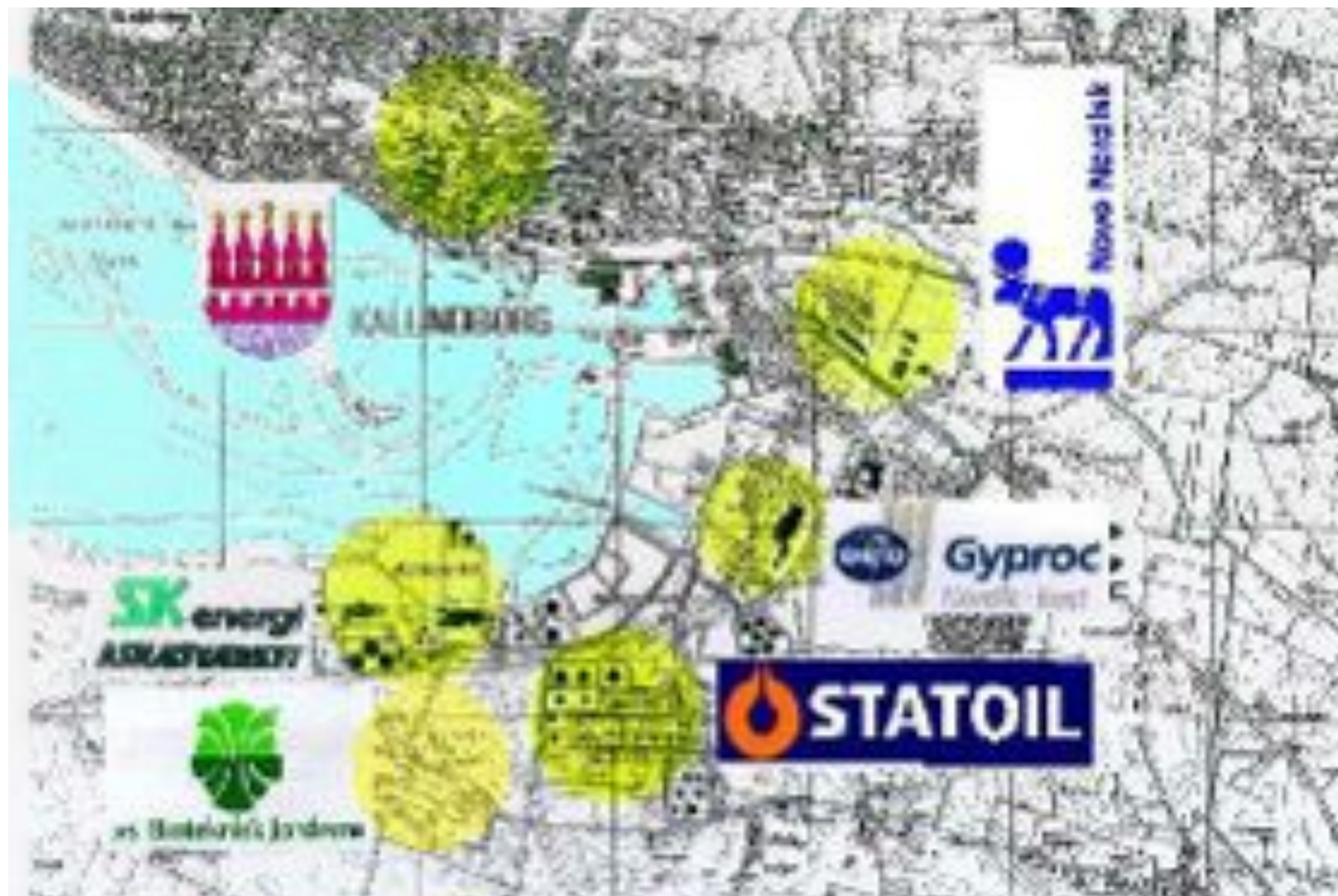
### ■ Networking between businesses

#### •Networking beyond Supply Chains



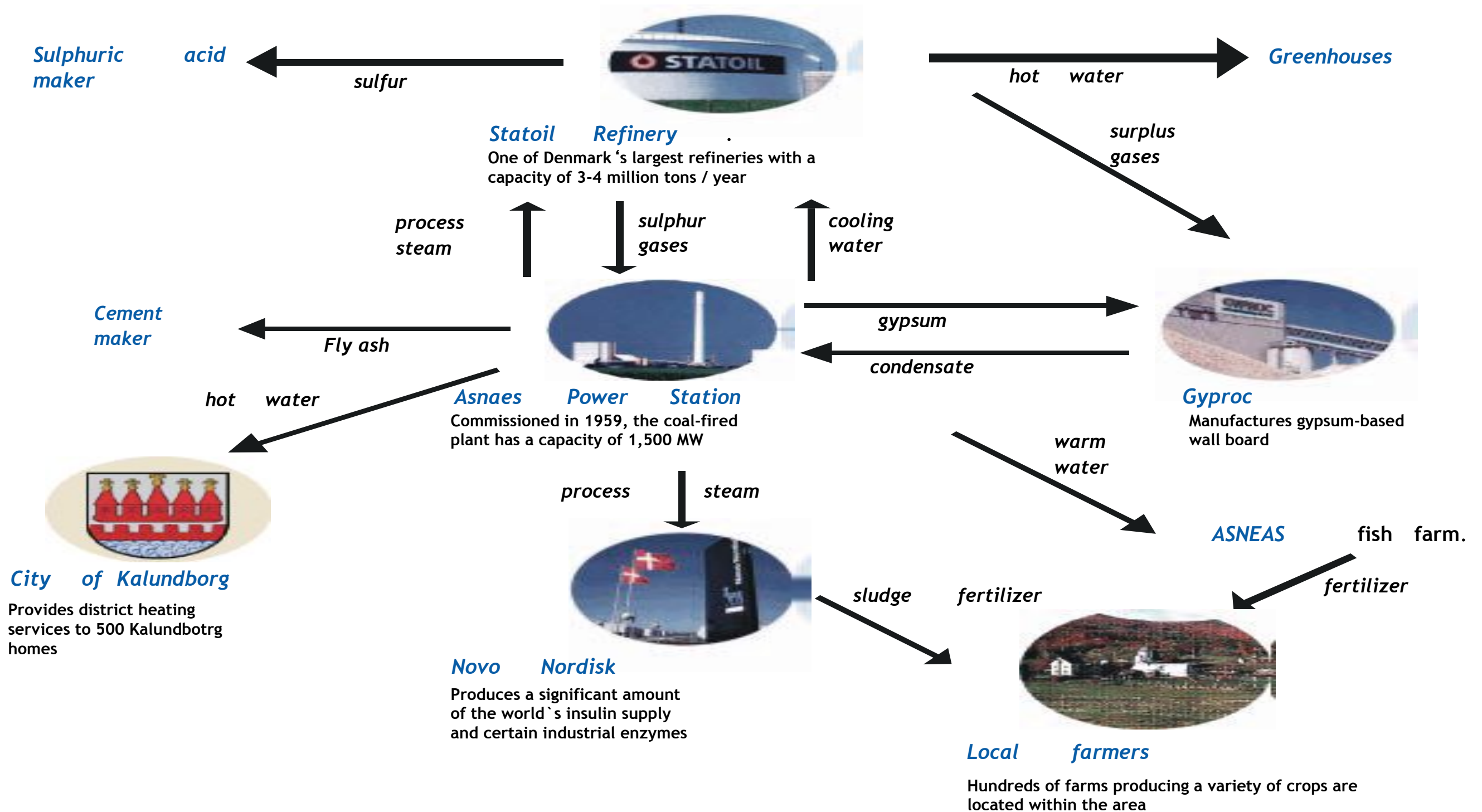
## The Kalundborg Symbiosis - Kalundborg - Denmark

- Large companies in a small town
- No system design
- No government involvement
- Symbiosis Institute as 'Gate Keeper'
  - many projects not implemented
  - 30 year development





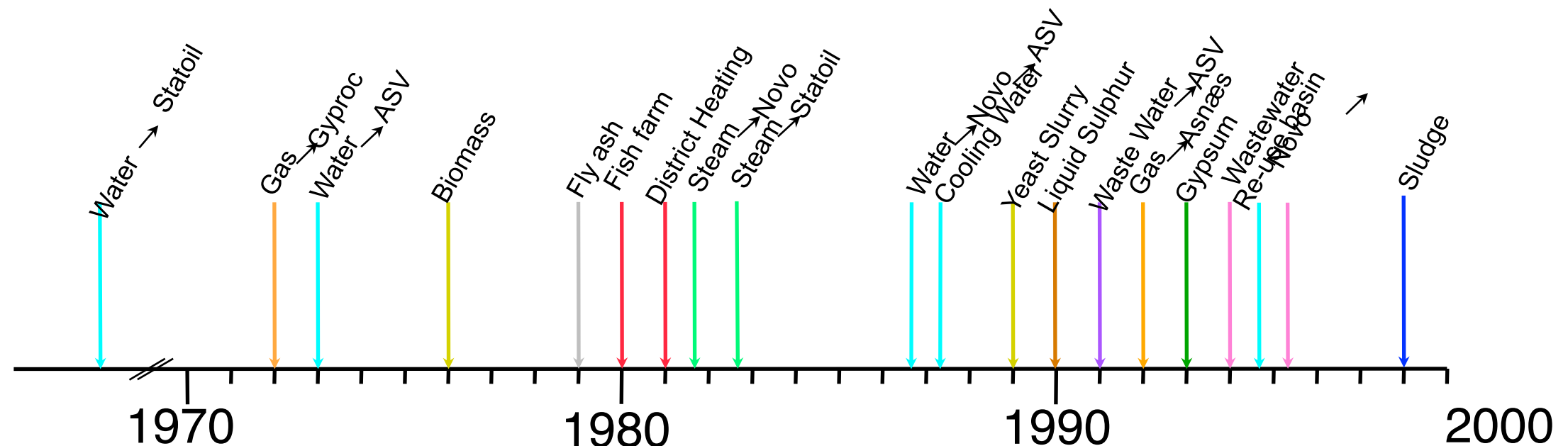
## The Kalundborg Symbiosis - Kalundborg - Denmark (2)



## EID Business Case: Kalundborg - Denmark

### ■ Kalundborg - the Non - EID Model

- Network of exchanges was not planned, no central management
- No government involvement (city is system partner)
- Symbiosis Institute focal point, only created recently
- activities were driven by economics, not environment
- many projects not implemented due to some economic obstacles





## ❑ **Projects between companies and Kalundborg municipality**

<b>Recycling of water:</b>	<b>9 Projects</b>
<b>Exchange of energy:</b>	<b>6 Projects</b>
<b>Recycling of waste products:</b>	<b>6 Projects</b>
<b>The “internal” Symbiosis:</b>	<b>15 Projects</b>
<b>The “external” Symbiosis</b>	<b>4 Projects</b>
<b>Not implemented projects:</b>	<b>many...</b>

*Data: 2000*

## ❑ **Industrial Symbiosis : Resource Savings & Budget**

### Resource savings:

Ground water:	1,9 mill. m3/year
Surface water:	1,0 mill. m3/year
Oil:	20,000 ton/year
Gypsum:	200,000 ton/year

*Data: 2000*

### Investment Budget:

**Total investments in 19 Projects:** ~ 75 mio. US \$

**Annual savings:** > 15 mio. US \$

**Total savings until 1998:** ~ 160 mio. US\$

*Data: 2000*



## Munich Riem: Great Tools - Limited Success



### Munich Riem Airport Redevelopment

Source: Munich Office for Economic Development





## Munich Riem: Great Tools - Limited Success

### Riem Service Park for SME

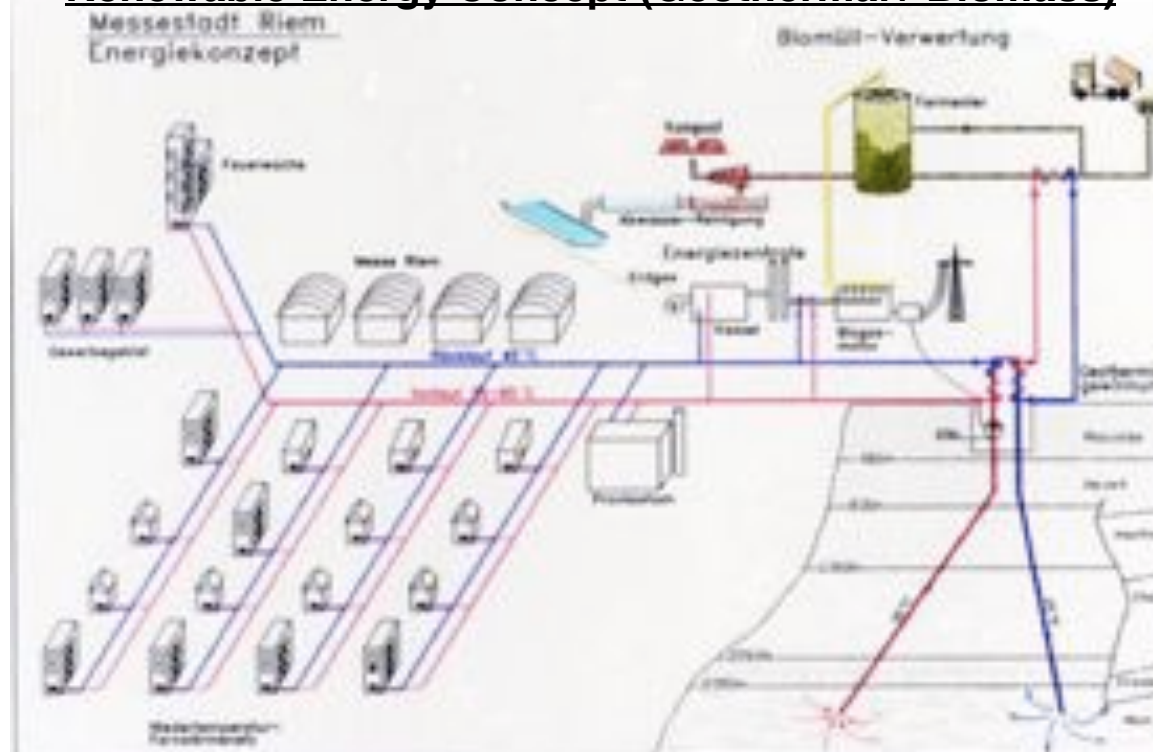


### Riem Arcades: Housing - Shopping - Community



Messestadt Riem

### Renewable Energy Concept (Geothermal / Biomass)



### Riem Office & Commercial Park for SME



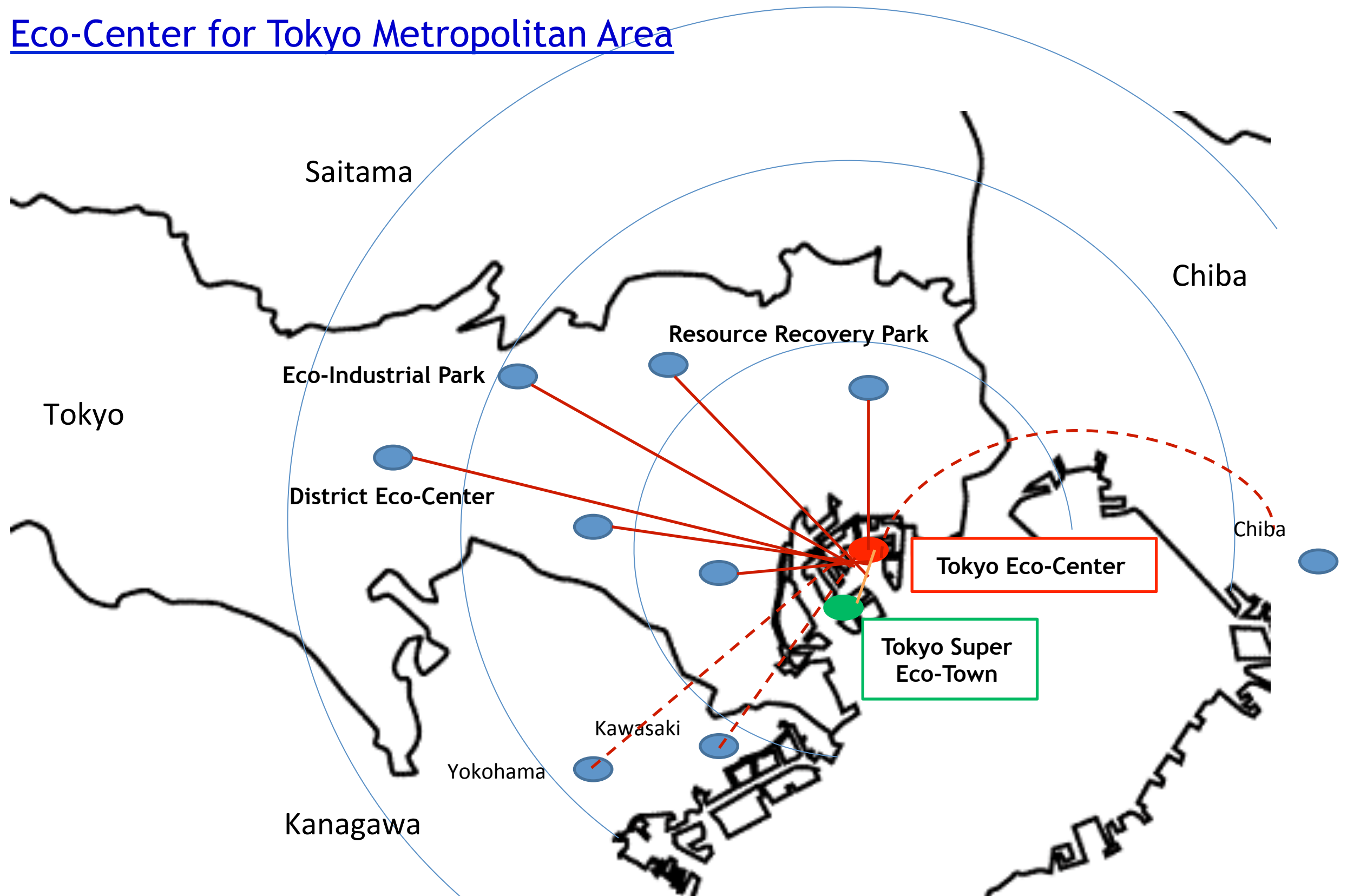


## Tokyo, Japan: **Tokyo Super Eco-Town** - Recycling & Energy Cluster

- **Tokyo Super Eco-Town:** Recycling Cluster based on zoning regulation
- National Eco-Town Program with local government support
- No direct government involvement
- Tokyo Super Eco-Town has active association (supported by Re-Tem Corp.)
- Clusters are based on Material Flow Analysis and partly co-location
- Vision: to expand clusters approach to all industrial areas
- Development of Eco-Center Concept for Tokyo Metro Region



## Eco-Center for Tokyo Metropolitan Area





## EID Business Case: National EIP Program - Korea

### □ National Strategy

- transform all industrial parks & clusters into Eco-Industrial systems

### □ 5 Pilot Sites of various industries

### □ National & Local Support

- Program Started by Korean National Cleaner Production Center KNCPC
- Supported and transferred to KIKOX National industrial development organization



Ulsan Industrial Harbor Zone - EIP Pilot

Banwol,  
Siwha

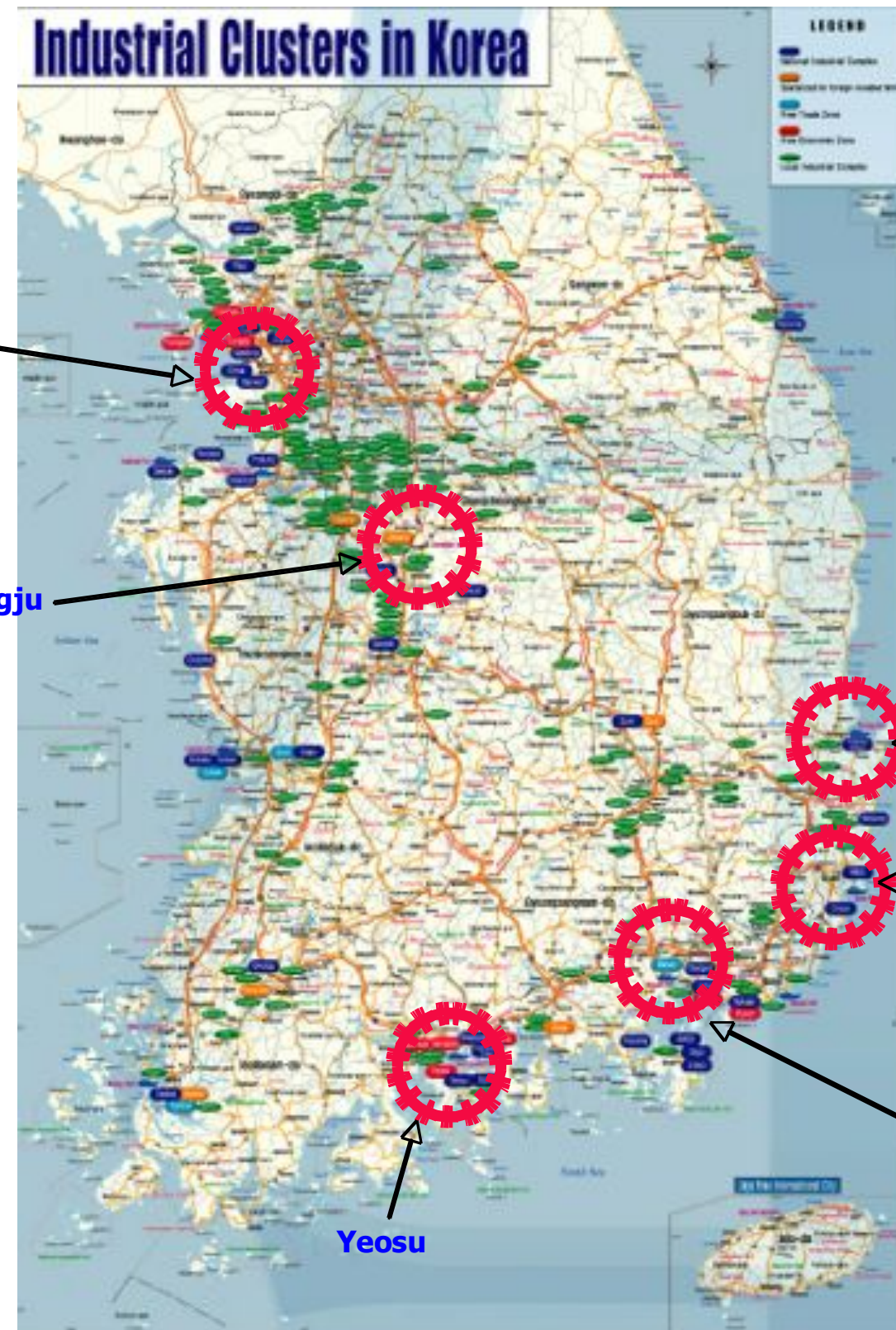
Chungju

Pohang

Mipo  
Onsan

Jinhae  
Haman  
Jinju

Yeosu

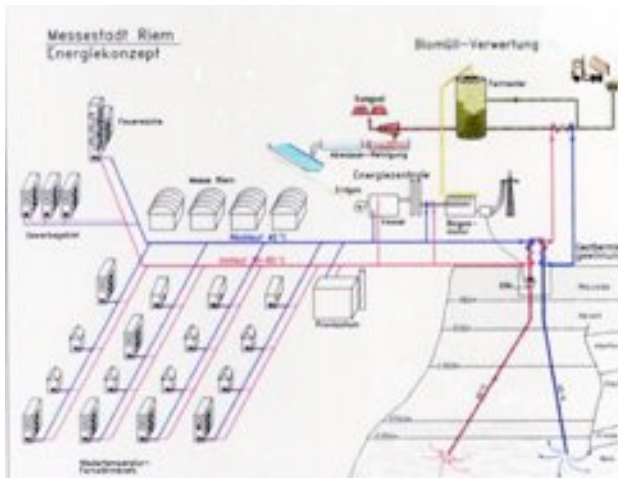


<Source : KICOX>



# Best Practice in Industry: Borrowing Ideas for Physical Features

Renewable District Energy



E-Shuttle Busses



Green Infrastructure



Green Industrial Buildings



Electric service vehicles



Clean Tech Incubator



Intermediate Use



Public transport integration



## EID Management: The Eco-Center

- ❑ **Management Plan:** Port maintains management role for GVBP
- ❑ **Eco-Management:** on-site Eco-Center or park office
- ❑ **Eco-Center:** multi-function management, service, education facility
- ❑ **Networking:** facilitating industrial community
- ❑ **Shared Facilities:** waste management, recycling, equipment rental, maintenance
- ❑ **Services:** after-sales-service for efficient operation, resource management, green procurement, energy efficiency
- ❑ **Community: environmental** education, technical service, social services available to community (first aid unit, day care)



***One-stop service = synergies***

TEDA Eco-Center Concept - Re-Tem



### Eco-Center in Operation

- **Burnside** Industrial Park, Halifax, Canada
- **Devens**, MA
- **TEDA** - Tianjin Economic Development Area China

Industrial Park Management Center



### Infraserv Hoechst Frankfurt

- Chemical Park service company
- 1900 employees (core)
- complete site services
- energy and resources
- disposal management
- logistics



## Map Ta Phut (Eco) - Industrial Complex: Extreme Challenges

- Eco-Mnagement - dedicated teams - and all is well ...?




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### Stand-off in Maptaphut: Rainbow Warrior protests at Belgian-owned coal power plant

July 15, 2008



**RAYONG, THAILAND** — Greenpeace flagship Rainbow Warrior today staged a peaceful protest against the expansion of a Belgian-owned coal power plant in Mapthaphut, Rayong province in Thailand, anchoring a few meters off the coal wharf and unfurling banners saying "Quit Coal" and "Coal = Climate Change". The ship was greeted by tug boats and coal plant personnel who fired water cannons as it entered the coal port.

Water cannons are fired as Greenpeace activists on inflatables unfurl banners at Mapthaput port, Rayong 250 Kms east of Bangkok. Greenpeace flagship Rainbow Warrior today staged a peaceful protest against the expansion of a Belgian-owned coal power plant in Mapthaphut, Rayong province in Thailand,

Greenpeace has slammed the hypocrisy of European countries on the issue of climate change. The environment group demanded that construction of the new 660 MW GHEDCO-one coal power plant owned by GLOW Energy be stopped because it will increase Thailand's carbon emissions,

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# Worldwide Eco-Industrial Development Initiatives





# ‘Acknowledged’ Eco-Industrial Parks and Eco-Industrial Networks





..... always start with a Vision

