

# CLIMATE CHANGE MITIGATION AND THE ROLE OF INDUSTRIAL PARKS

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Real Corp 2011 - Essen - Friday 20V2011

## QUESTION

climate change mitigation

Flanders

- public co-financing (re)development industrial parks
  - guidelines design, issuing and park management
  - *carbon neutral electricity consumption*

eco-industrial parks (EIP)

- sustainable spatial use
- park management and services
- inter-company cooperation

**apply EIP to carbon neutrality ambition**

## POSITION

intermediary focus

- carbon emissions / energy
- development / management industrial park

additional opportunities

continuity

- technical
- spatial
- institutional
- temporal



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## SUSTAINABLE ENERGY USE

company's position

- value chain (ex. use ABB-product 99% BKG-emissions)
- energy value chain (ex. electricity as secondary energy)

carbon neutral trias energetica

- need
- reduction energy use / reuse residual energy
- renewable energy / residual energy
- compensation carbon emissions
  - natural / artificial



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## SUSTAINABLE ENERGY USE INDUSTRIAL PARKS

general energy measures

- buildings (-70%)
  - layout
  - building techniques
  - fitting techniques
- processes (-20%)
  - machines/installations (-20% elek. door motoren bijv.)
  - maintenance / process control
  - waste heat / waste power (-5% tot -40%)
  - energy and emissions management / benchmarking (-5%)



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# SUSTAINABLE ENERGY USE INDUSTRIAL PARKS

general energy measures

- renewable energy (activity / environment)
  - electrical and thermal
  - supporting techniques as storage, heat pumps
- tune energy use, electrification, imbalance

barriers

- symptomatic
- actual



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## SUSTAINABLE ENERGY USE INDUSTRIAL PARKS

developers / management

- symptomatic barriers
  - design / planning guidelines
  - utilities
  - knowledge / guidelines / audits
  - energy / emissions management

## COMPANY LEVEL

### *carbon neutrality*

- start / access
- *carbon neutral electricity consumption*
  - options
  - definition volume
  - reporting
  - control
  - enforcement
  - creativity





## COMPANY LEVEL

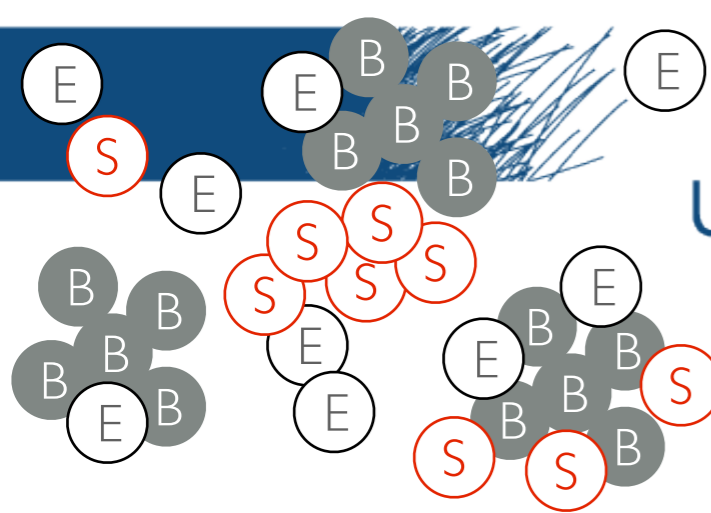
### *carbon neutrality*

- trias energetica
  - energy efficiency
  - *carbon neutral heat consumption*
- strategies
  - standards
  - support
  - reward / challenge

## ENERGY CLUSTERING

clustered energy management

- Sappenleen Poperinge : 100 companies -  $\sum 0,26 P_{jpr}$
- Herdersbrug Brugge : 90 companies -  $\sum 0,8 P_{jpr}$
- Waggelwater Brugge : 16 companies -  $\sum 0,1 P_{jpr}$



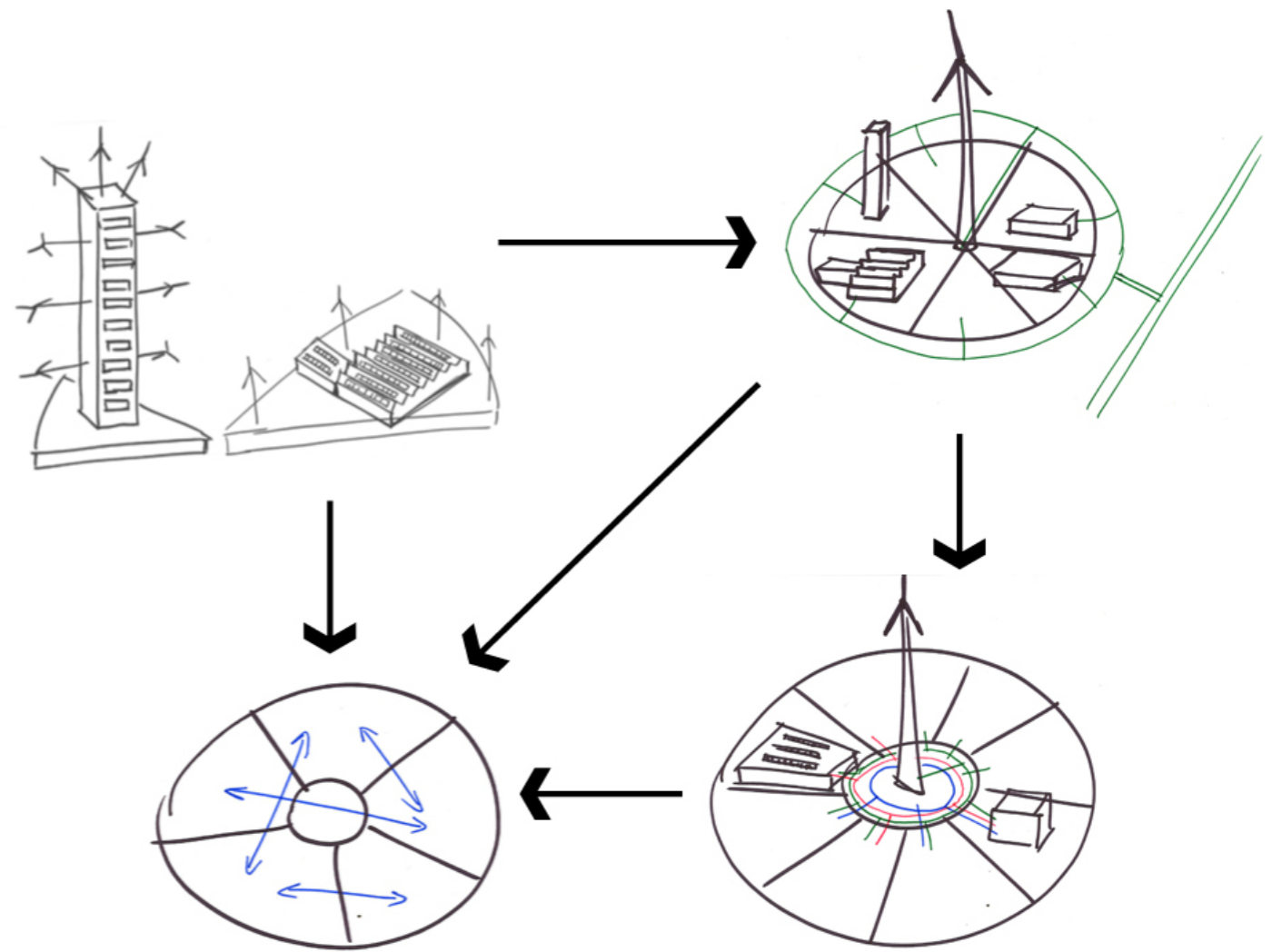
# ENERGY CLUSTERING

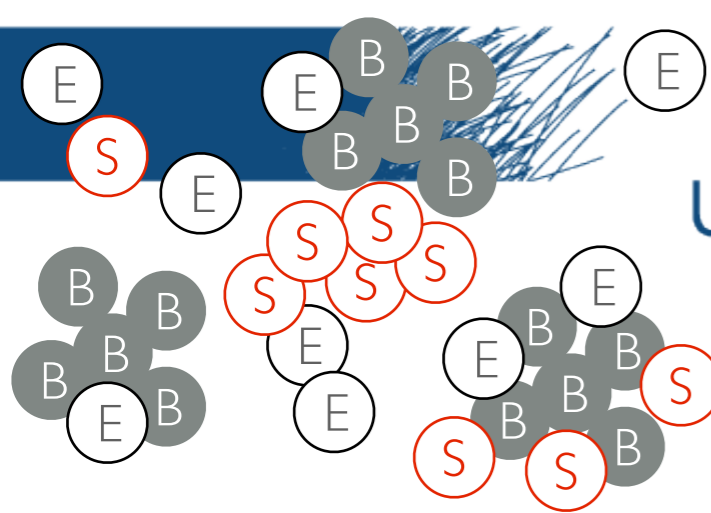
## service clustering

- purchasing
- maintenance
- management

## physical clustering

- production
- integration
- distribution





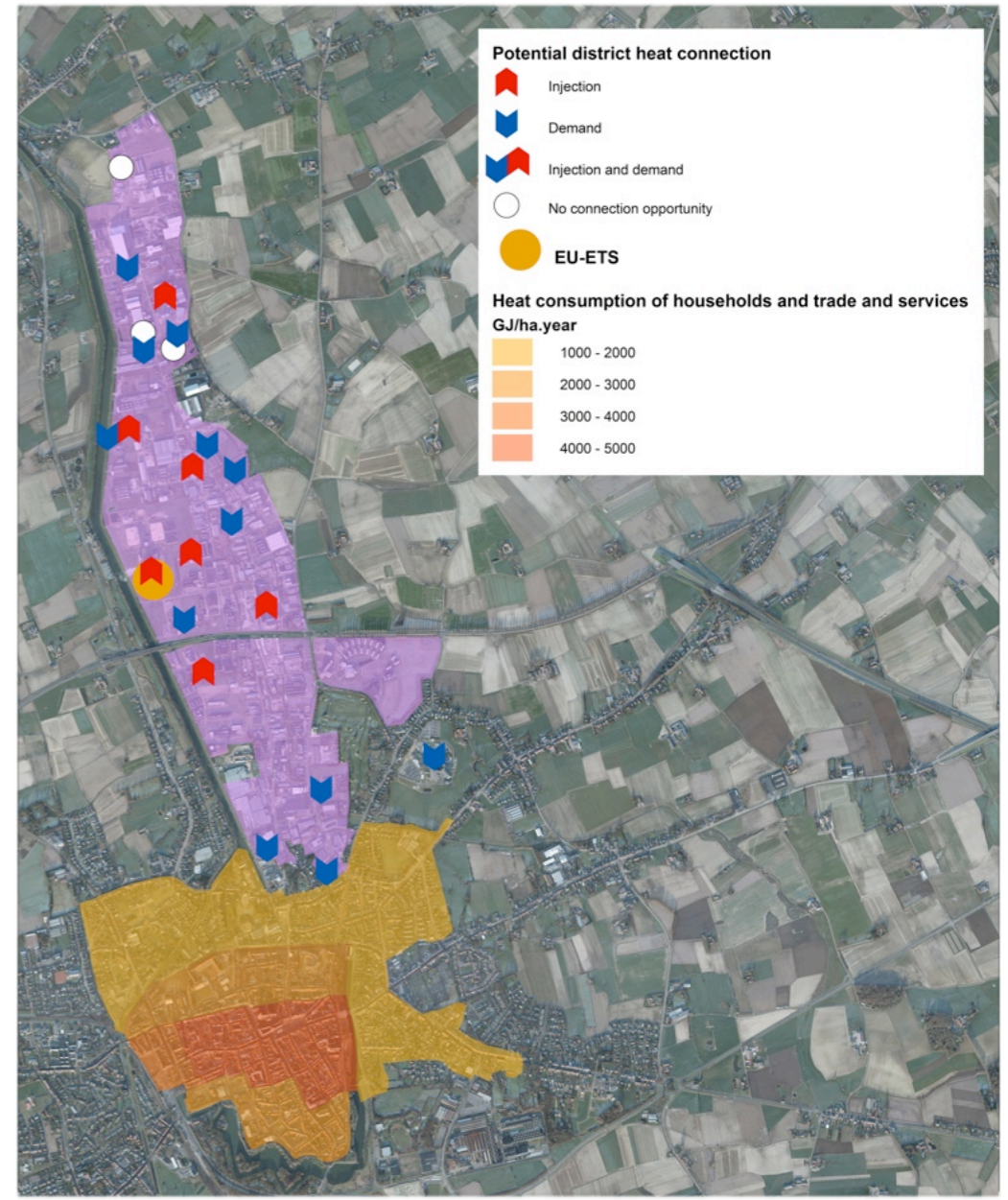
# ENERGY CLUSTERING

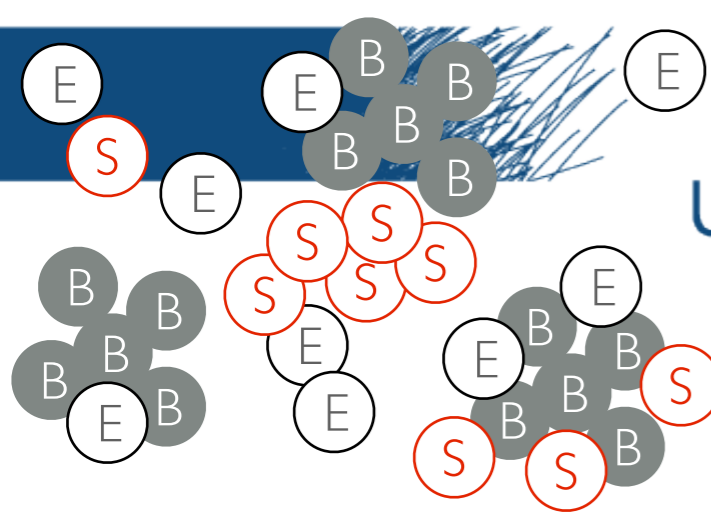
clustered energy production

- one or more installations (VPP)
- decoupling
- traditional and mixed parks

integration

- residual energy / individual production
- traditional parks
- mixed parks





# ENERGY CLUSTERING

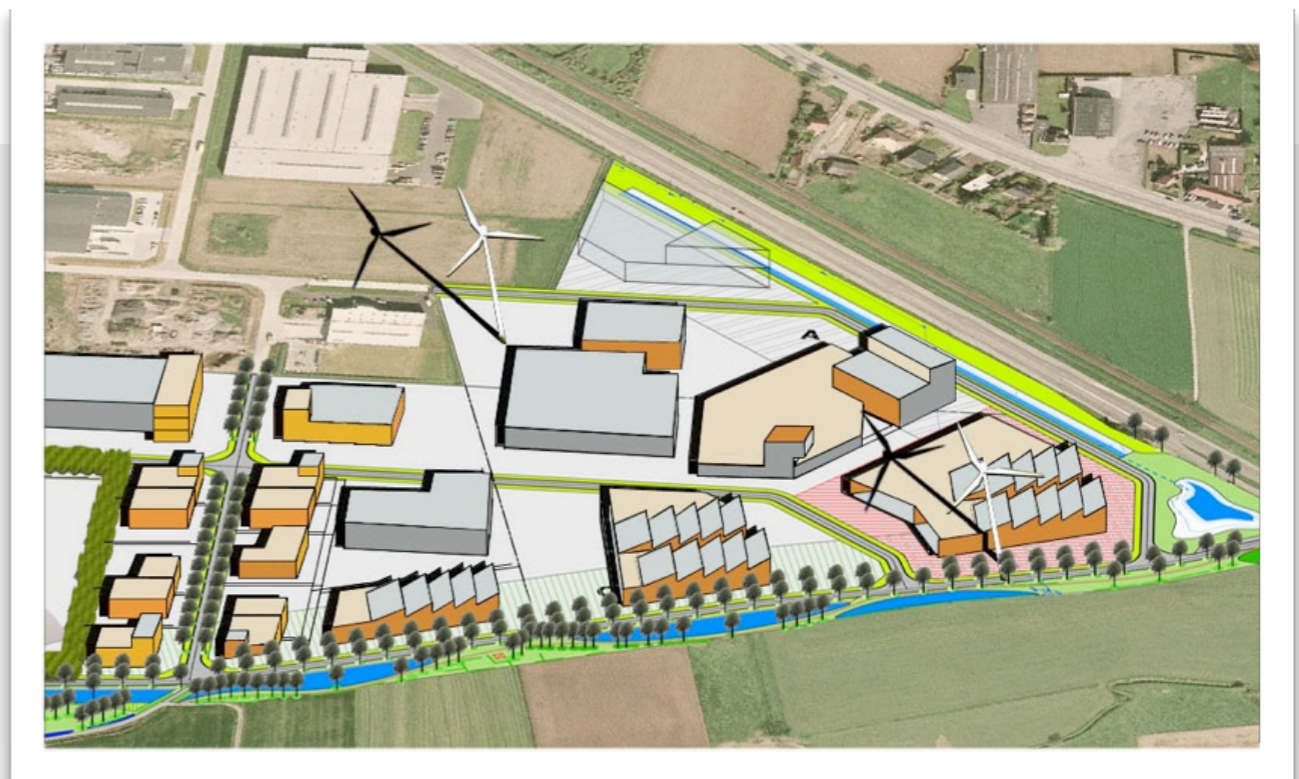
attainability

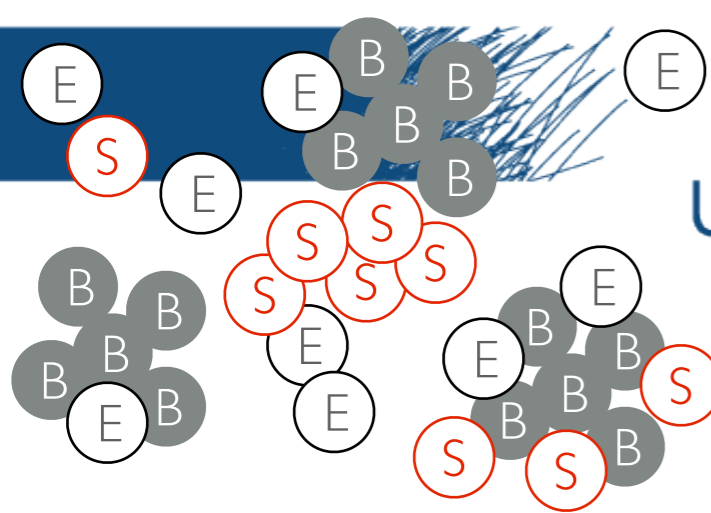
- technical / spatial
- financial
- legal
- social

developers / management

- barriers
- robust utilities
- detection

activation companies





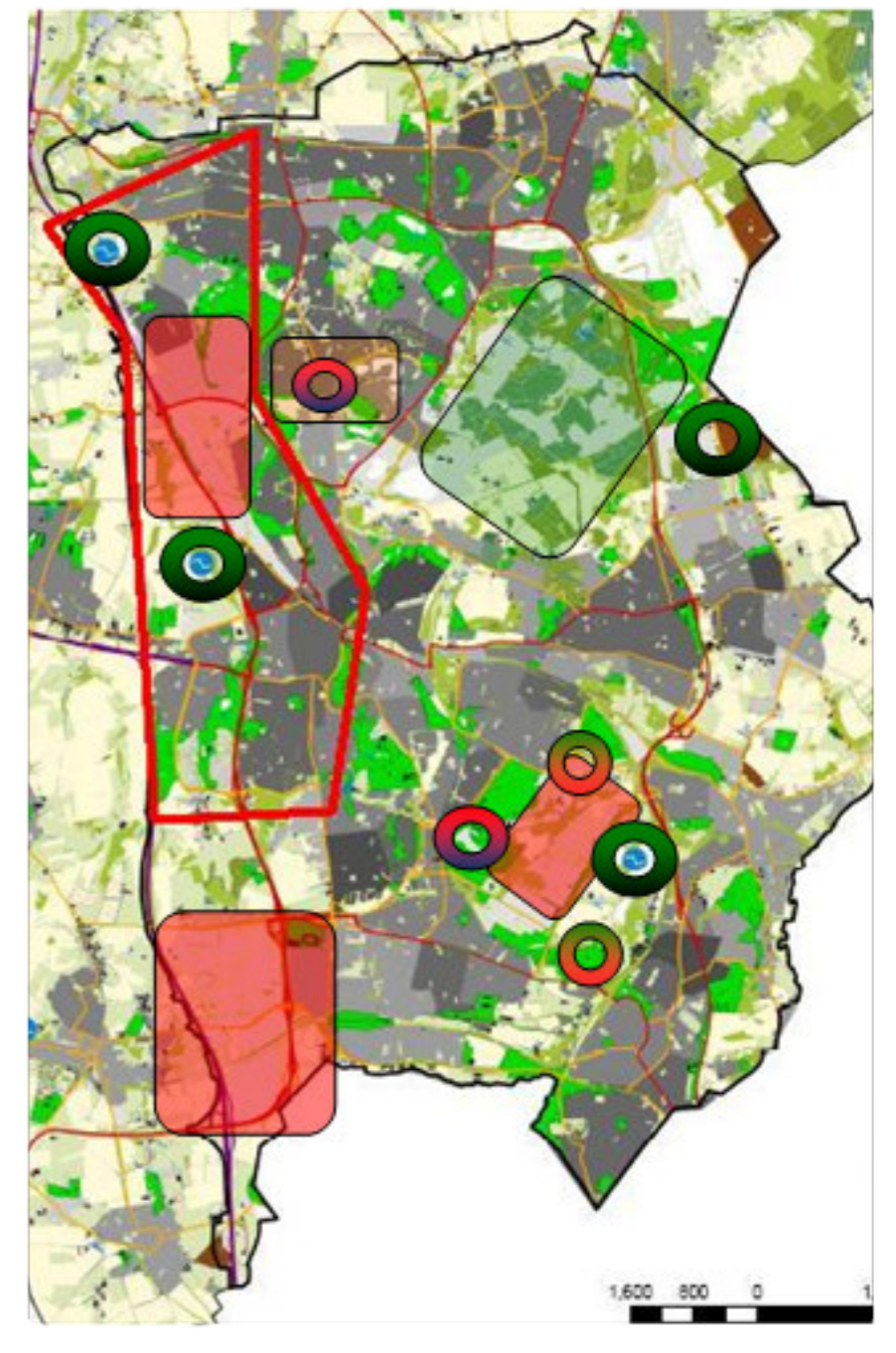
# SPATIAL QUALITY

park

- company lots
- industrial park

landscape

- exergetic efficiency
- energy availability
- differentiation & interweaving





# GUIDELINE FOR CO<sub>2</sub> LEAN ENERGY PROVISION

	Preparation	Design	Realisation	Issuing	Exploitation
ambition	def. ambition support				
	check ambition				activate companies evolution
location	analyse & select company types & sites based on energy consumption and bearing capacity	tune design park & building blocks	start company recruitment	issuing based on energy profile company & location stimulate integration renewables	
utilities	analyse potential for energy production, storage, supply & exchange contact stakeholders	design park & lots, planning guidelines	management structure & realisation utilities	stimulate renewable energy production & consumption stimulate/compel collective installations control prescriptions	
reduce	analyse potential of rational energy use	design park & lots, planning guidelines	multiple tenant buildings realise park		E <sup>3</sup> -monitoring stimulate energy efficient buildings and installations control prescriptions
inter-company cooperation				test potential cooperation activate companies in park management	detect & support potential cooperation



## STAKEHOLDERS

support

industrial park  
developers  
and  
park management



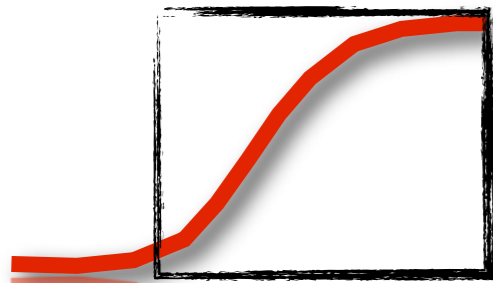
companies  
spatial planning  
energy policy  
climate policy  
economic policy  
DSOs / TSOs

institutional barriers

cooperation platforms

- specific industrial park management
- industrial parks management





## MOMENTUM

interest

importance

- sustainable energy provision
- knowledge and expertise
- market

action

- financial / institutional continuity
- innovation policy
- discontinuity?
- research

# CLIMATE CHANGE MITIGATION AND THE ROLE OF INDUSTRIAL PARKS

Ghent University

Centre for Mobility and Spatial Planning

Research group Environmental and Spatial Management

Research topics: eco-industrial parks / energy management and planning / industrial ecology/...

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