



**Flanders**  
State of the Art

# From Brownfield to Brightfield: revitalizing and re-powering derelict land in Flanders (Belgium)

**Reclaim conference - Athens**  
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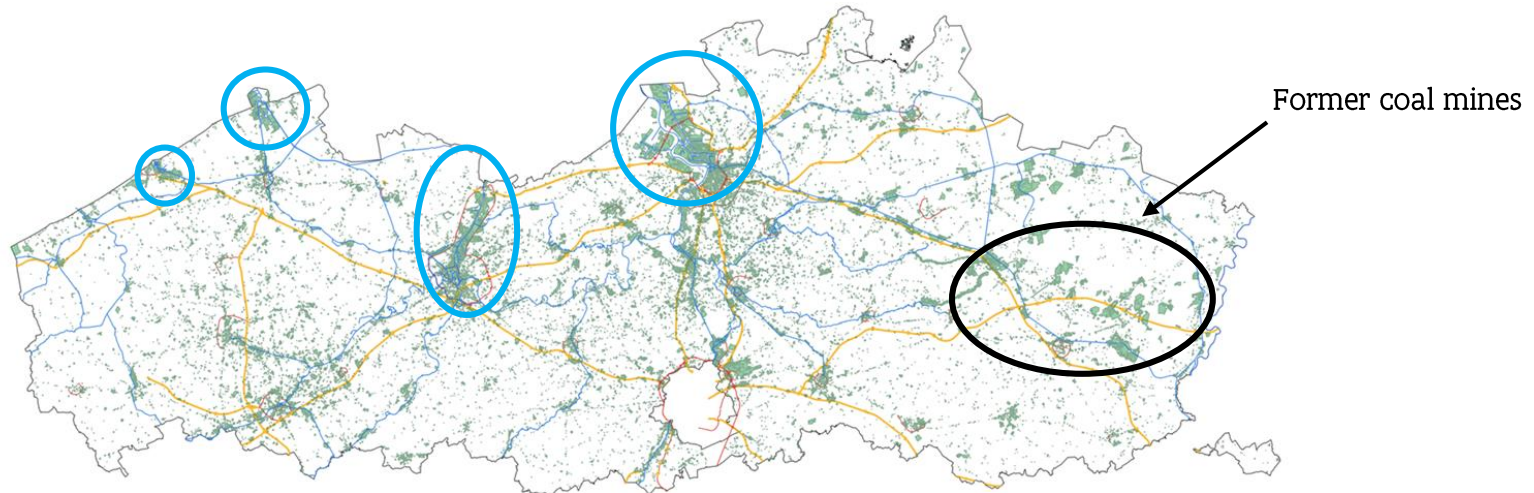
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**OVAM**

# Outline of the presentation

- ▶ Industrial activities and soil contamination in Flanders
- ▶ Frameworks to remember
- ▶ ‘Multi’ as a key to sustainable solutions and results
- ▶ Brownfield redevelopment and revitalization

# Industrial activities on regional scale (Flanders)



## Land Information Register (OVAM) :

- Approx. ca. 34.000 locations investigated; approx. 2.700 remediations completed;
- Estimated risk locations : 85.000 (12.000 sites potentially require remedial actions);
- Links to industrial axes, harbours, mining areas.



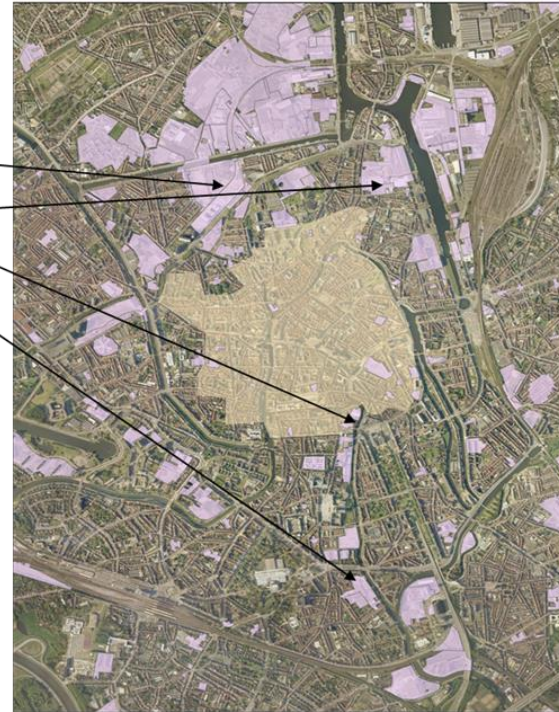
# Industrial activities on local scale (Ghent)

Mapping historical activities.

Ferraris map 1776



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Industrial activities are situated nearby the historical city center. E.g. former gasworks are close to the border of the center of 1776 and in the vicinity of waterways. Currently embedded in residential areas.

# Framework and objectives on soil remediation

## Legislation

- Soil Remediation Act of 22 February 1995
- Soil Act of 27 October 2006

## Aims of the Soil remediation Act

- To deal with soil contamination that has taken place in the past, over a period of 40 years, starting in 1996
- To prevent or immediately remedy new soil pollution

## Tiered approach :

- investigating the problem
- risk analysis
- design of a remedial action plan
- tendering
- executing the remediation works
- Monitoring / aftercare

# Industrial activities and remediation: getting started and searching dynamic processes.



Closure and remediation of a former steel cokes manufacturing plant. Full demolition. No conservation due to high pollution (PAHs, heavy metal,...).



# Industrial activities and remediation.

- more than 3.000.000 soil certificates are delivered
- 34.179 preliminary soil investigations are evaluated
- 12.548 descriptive soil studies are evaluated
- 4.494 soil remediation projects are approved
- 4.085 soil remediation works have been started and about 2.785 have already been finished



# Industrial activities and remediation.

## General conclusions:

- particular large contaminated sites were selected and a specific remediation programme was developed (mines, gasworksites);
- focus on the contamination and the remedial actions / cleaning;
- first steps to an integrated approach by combining soil remediation and the redevelopment of the site;
- limited interest for the site in its broader spatial, economic and societal environment;
- limited multi-actor governance and essentially restricted to environmental issues and public actors (environmental and scientific steering committee installed for coal mines);
- brownfields remain often unaddressed and have adverse influence on neighbourhood;
- recommendations resulted in a specific legal instrument on brownfield redevelopment in Flanders.



# Brownfieldcovenant Act

**March 22, 2007**

Definition of brownfield :

- former abandoned or under-used industrial site
- (perceived) soil contamination
- redevelopment is a complex process
- active potential for reuse

Advantages :

- single contact point (Agency for Entrepreneurship)
- negotiator appointed by the Government
- guided participation process
- integrating multiple governmental permits
- follow-up and monitoring by steering committee
- tax reduction (10%) at land acquisition
- no financial guarantee on soil remediation
- covenant : signed agreement

Results (September 2015) :

- 6 calls -> 146 proposals introduced
- 70 signed covenants
- 1.250 ha redeveloped



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# Governance and roadmap to redevelopment

The Regional Brownfield Committee (RBC) of Flanders plays a major role in policy-preparation and negotiation of brownfieldcovenants. The RBC is assisted by 3 negotiators (appointed by the Flemish government, March 2009). After approval and signing of the covenants, the negotiator become chairman of the steering committee.

Roadmap to brownfield redevelopment :

- Call for projects (RBC);
- Evaluation of proposals (governmental agents);
- Official publication of project zone (Belgian State Journal);
- Negotiation phase of individual projects (projectplatform);
- Public information sessions and publication on website;
- Covenant signed by Flemish government;
- Steering committee installed to monitor implementation



# Multiple aspects to manage: the quadruple helix model

The success of realizing complex projects such as town redevelopment and brownfield revitalization depends on the effectiveness of the integration of various parameters. This consists of a stepwise process of connection, building awareness, need of urgency, mutual trust-building and learning.

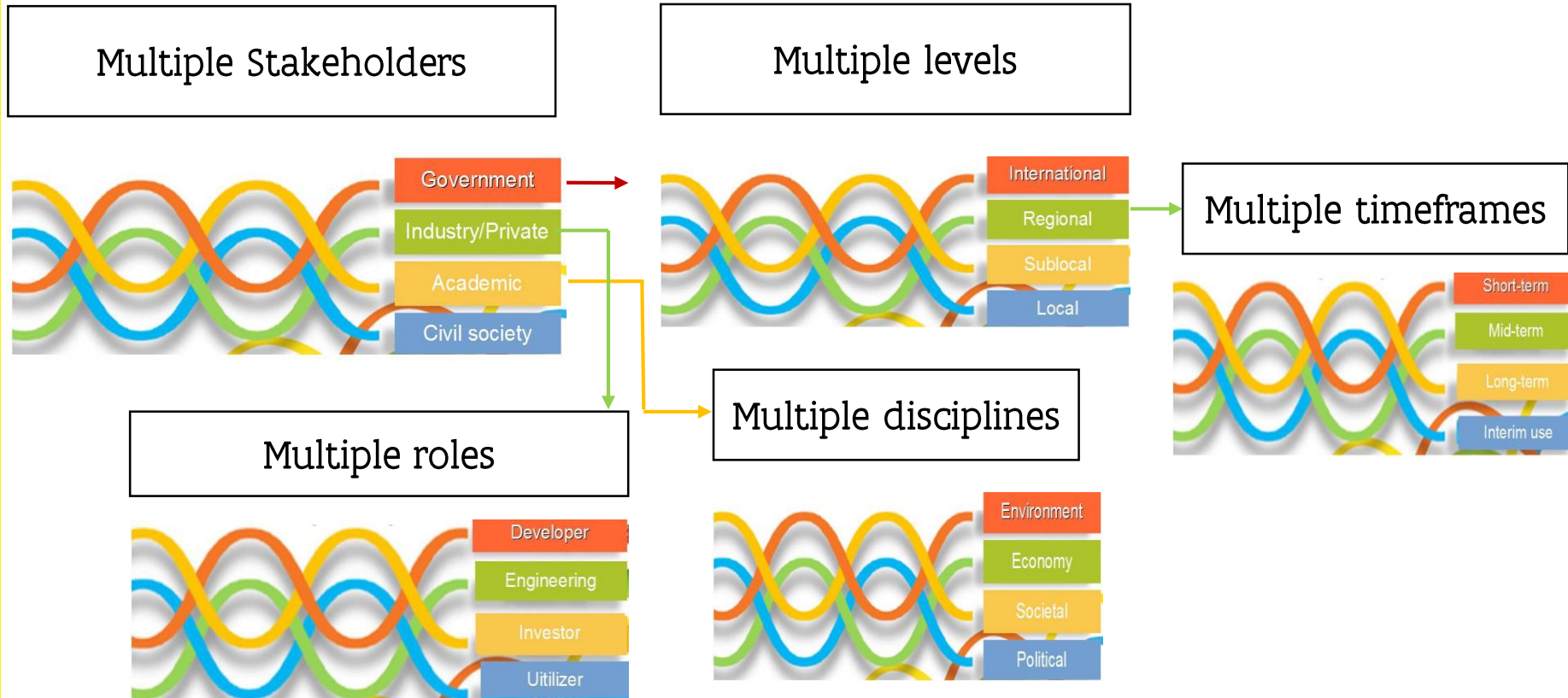
The Quadruple Helix is a user-oriented innovation approach and suitable for our purpose. It symbolizes the interlinkage between multiple aspects and encodes the instructions for a successful future.

- ▶ the Quadruple Helix model encourages to reflect on multiple possible dynamics in various systems;
- ▶ collection of potentially relevant data;
- ▶ bringing stakeholders together;
- ▶ development of relevant indicators.



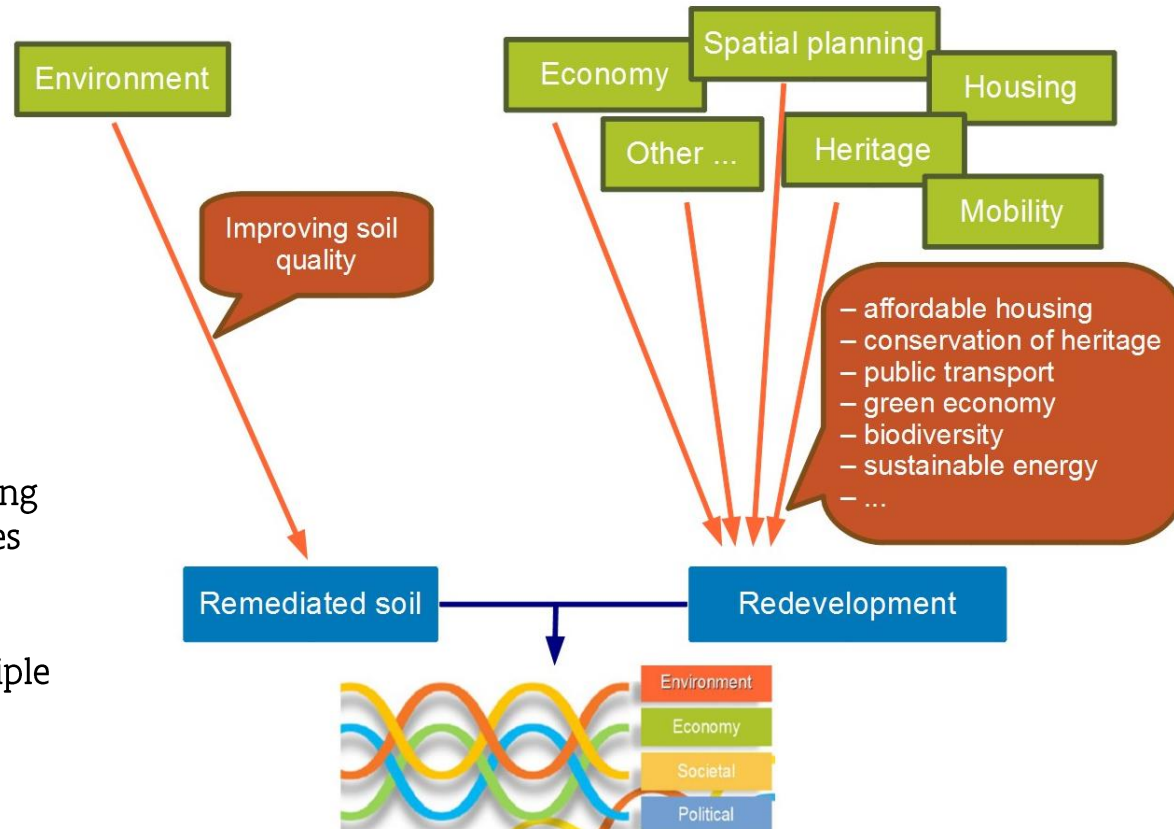


# Multiple aspects to manage: the quadruple helix model



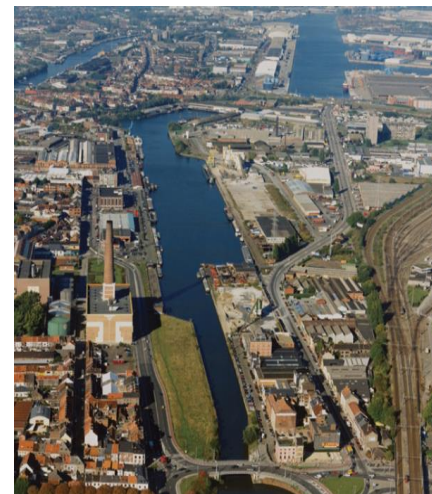
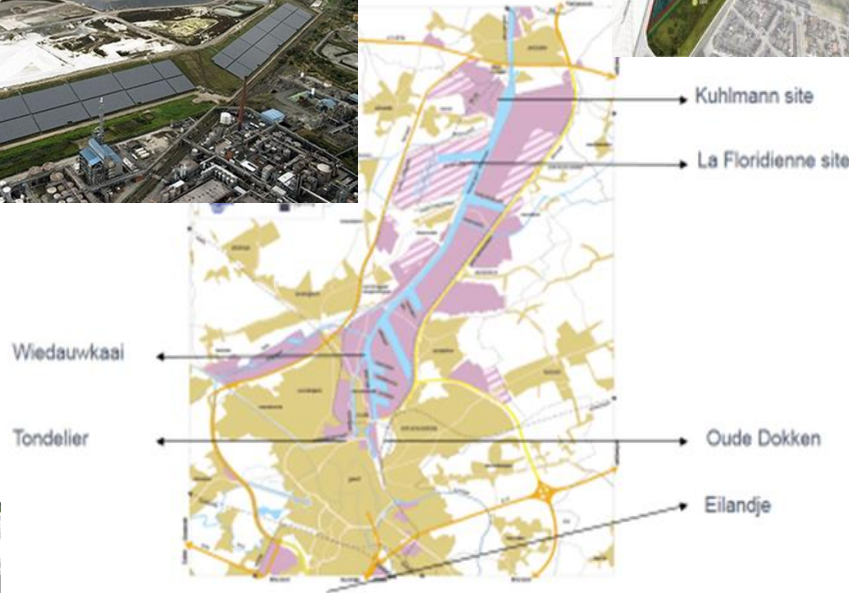
# Multiple aspects to manage: the quadruple helix model

**Multi-actor governance:**  
creating added value and realizing mutual objectives and interests by interlinking and integrating multiple demands and policy-interests.





# Integrated approach on a site and regional scale (Ghent region)





# From Brownfield to Brightfield. Terranova project – Harbour Ghent



- Former fertilizer production plant;
- Bankruptcy in 2009;
- 85 ha of gypsum waste landfill;
- Height : 30 – 40 meter;
- Approx. 25 million m<sup>3</sup> of waste;
- Hydraulic transported to landfill:
- Pond containing 'water' at pH 1,5;
- Recent ponds contained by HDPE;
- Total landfill hydrogeological isolated by pumping system;
- Precautionary measures by OVAM;
- Brownfields redevelopment started after acquisition in 2010.

# From Brownfield to Brightfield. Terranova project – Harbour Ghent



The total project is split in to two autonomous projects:

## Project CR<sup>2</sup>

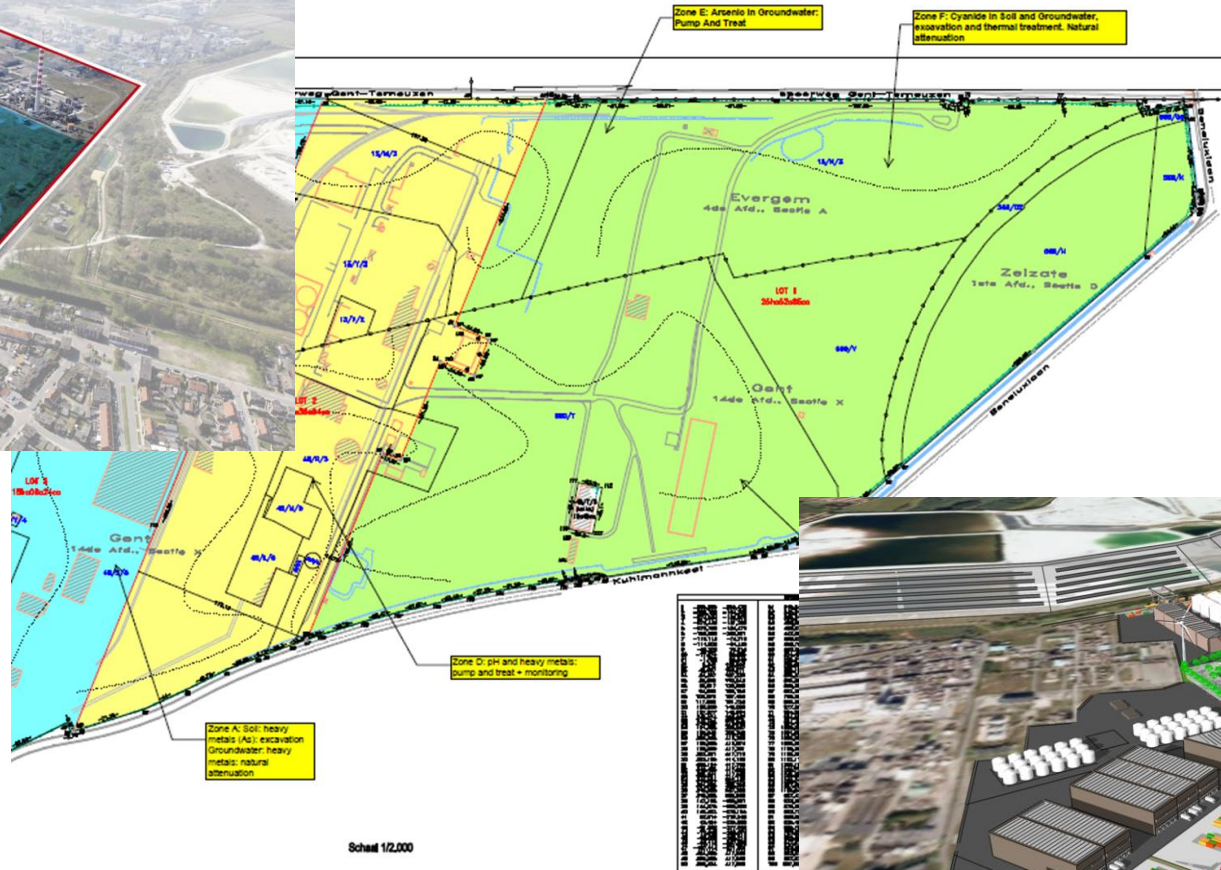
- 40 ha
- Soil and groundwater remediation
- Sediment treatment center
- Redevelopment and sale of the site

## Project Terranova

- 85 ha
- Groundwater remediation
- Landfill
- Solar energy plant



# From Brownfield to Brightfield. Terranova project – Harbour Ghent



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# From Brownfield to Brightfield. Terranova project – Harbour Ghent

NOV 2010: LANDFILL OPERATIONS IN NORTH CELLS



NOV 2010: EXCAVATION WORKS IN SOUTH CELLS

Treatment of acid water



Capping of the gypsum

# From Brownfield to Brightfield. Terranova project – Harbour Ghent



Capping, installing drainage, final cover



# From Brownfield to Brightfield. Terranova project – Harbour Ghent

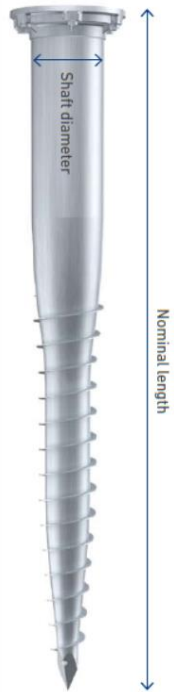


Construction of a 16,5  
MegaWatt/year Solar Energy  
Plant :

- 56.000 panels
- average consumption of  
4.000 households



# From Brownfield to Brightfield. Terranova project – Harbour Ghent



33.000 screw pillars  
each of 1,2 meter  
length



# From Brownfield to Brightfield. Terranova project – Harbour Ghent



Multi modal site:

- Waterway;
- Highway;
- Railway;
- High pressure pipeline LNG;
- High voltage power line.



# Brownfieldproject Eilandje - Ghent



Former landfill site  
Remediation method: containment

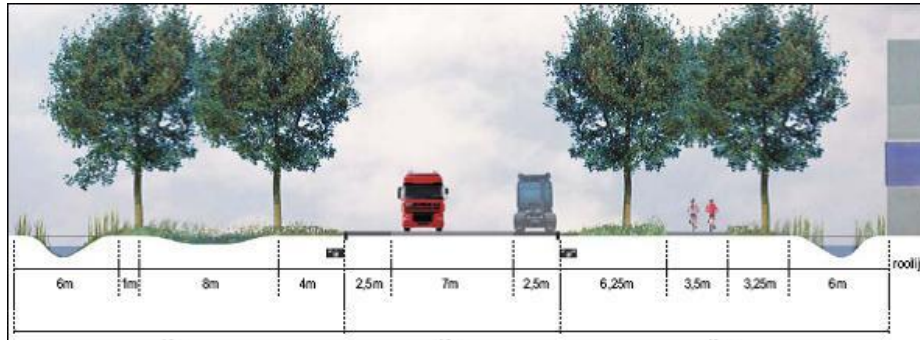
Redevelopment opportunities:

- vicinity city centre of Ghent;
- multimodal access;
- motorways E40 and E17;
- Scheldt river, canal Ringvaart;
- connection with harbour of Ghent





# Brownfieldproject Eiland - Ghent



Redevelopment as research park and logistic facilities (35 ha) combined with new park area (12 ha)



# Brownfieldproject La Floridienne - Ghent



The La Floridienne-site is an abandoned industrial site of 10 hectare at Ghent Harbour. Till 1960, the company produced metal salt such as zinksulphate and leadchloride, but also cyanidesalts. Soil and groundwater were heavily contaminated with arsenic and cyanides.

The remediation plan was a combination of containment, immobilisation and groundwater treatment. An important part of the vertical barriers were also functional as a quay of the new dock.



# Brownfieldproject La Floridienne - Ghent





# Thanks for your attention and enjoy the coming sessions

Eddy WILLE, negotiator & representative  
Flemish government

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