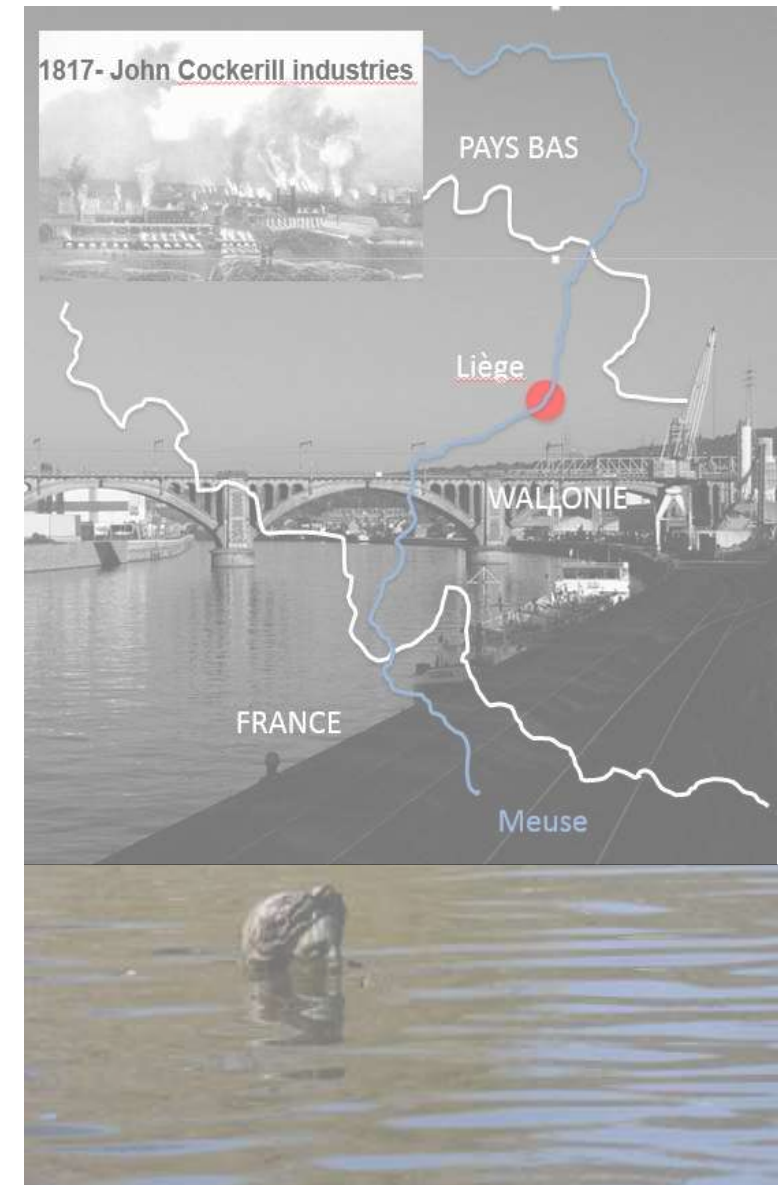


Bioremediation techniques:  
from environmental regeneration to cultural re-appropriation  
in post industrial landscape



- 1 . Context: Territorial transformation in Liège
- 2 . Object: Recovering brownfields: tools and actors
- 3 . Research theme: Reclaiming brownfields with a landscape approach
  - 3.a Detecting some eco\_logics as case study
  - 3.b Exploration of techniques possibilities in Wallonia
  - 3.c Emerging questions/concludsions
- 4 . Project as a medium: research perspectives in Lab VTP

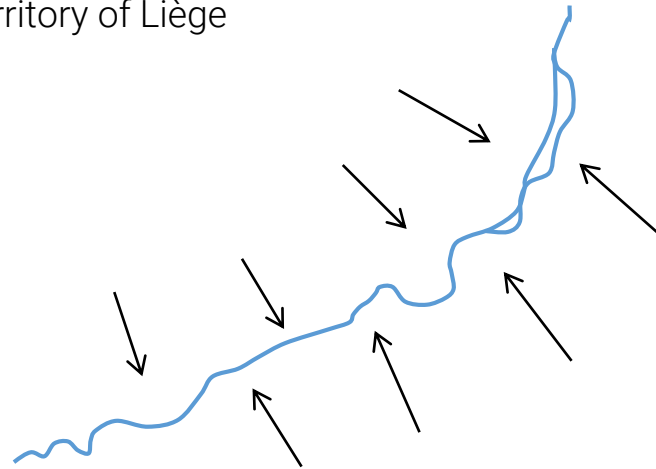




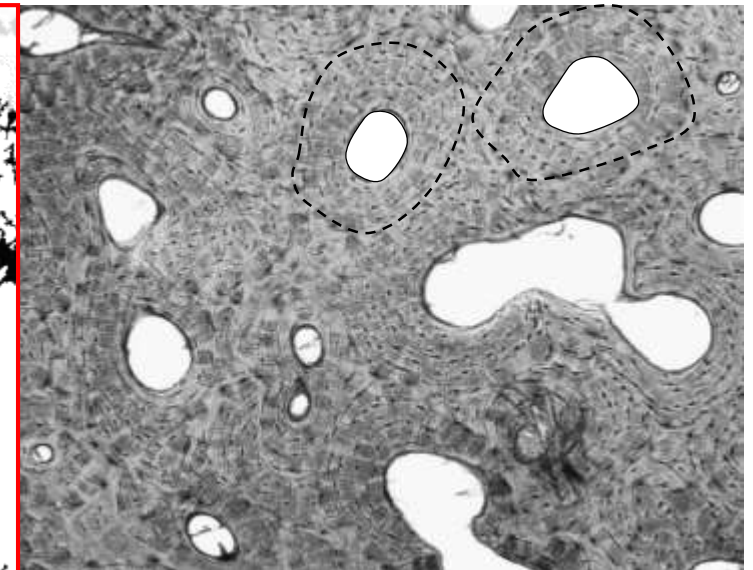
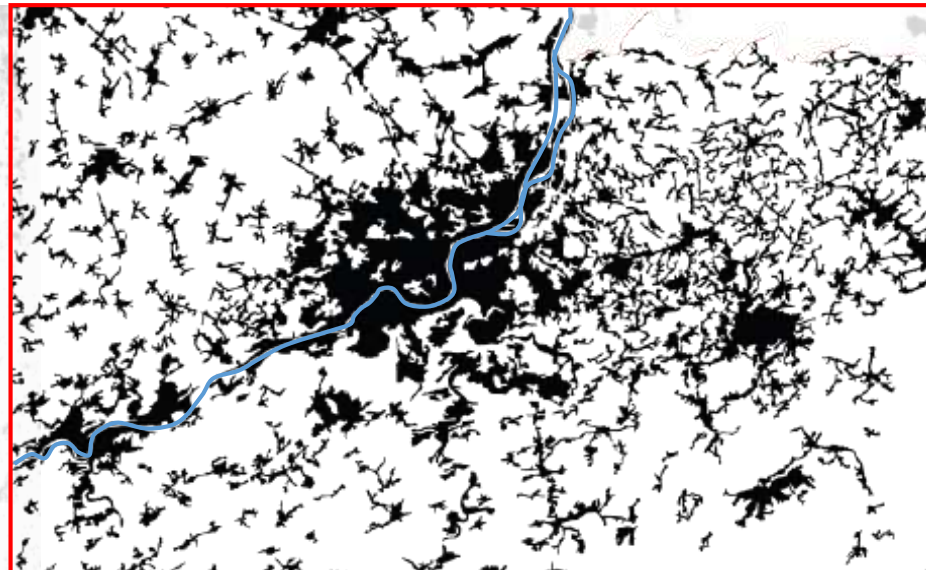
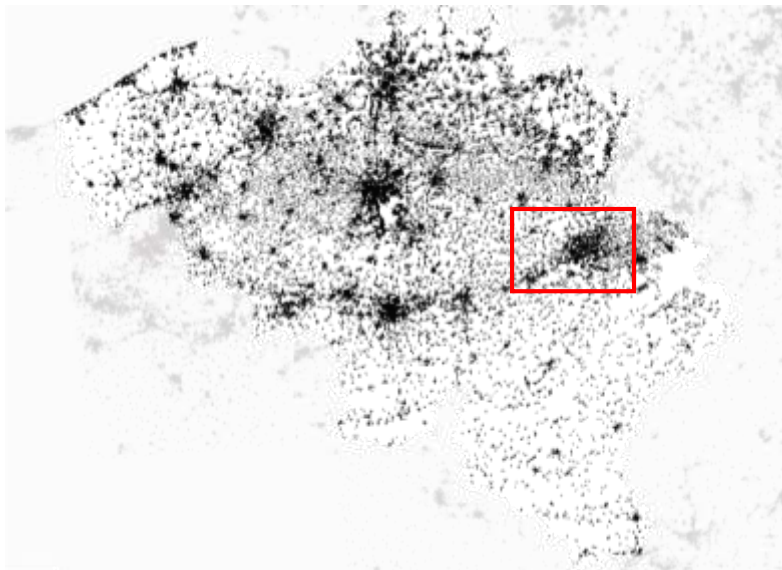
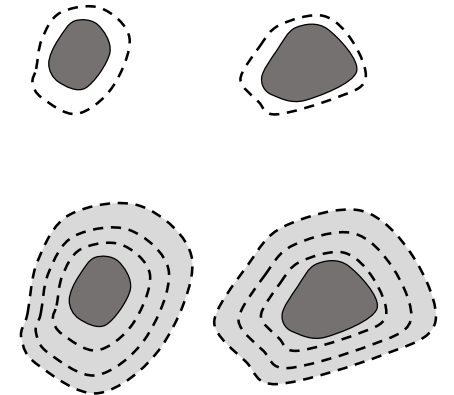
# Territorial dynamics in the territory of Liège:

- Urban sprawl / rurbanisation
- Urban voids / desindustrialisation

The river Meuse as matrix of the urbanisation in the territory of Liège



From polarities to voids inside the urban fabric







Th. Baeyer del. 4108

Ing. Lacroix A. C. Paris

SOCIÉTÉ JOHN COCKERILL. DIRECTEUR GÉNÉRAL: E. SADOINE.

From rural landscape to industrial landscape



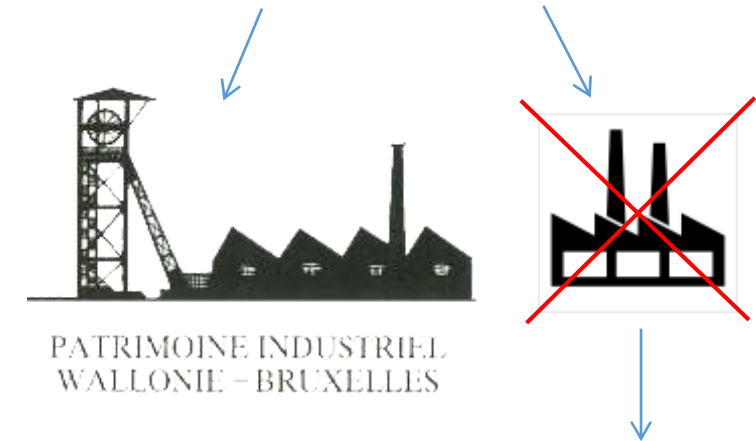


## The desindustrialisation and its effects

Unemployment / Pollution / Urban decline

## Necessity of requalification programs

Different interpretations of the industrial heritage : to be preserved or to be deleted ?



Human health and environment remediation: the Soil Decree «**Decrét relatif à la gestion des sols**» 05/12/2008.

Promotion of an economic redevelopment: The **Plan Marshall** in Wallonia:

P. M 2.vert in 2005 ---> PM4.0 in 2015





## Redevelopment areas (SAR – sites à réaménager)

*Code Wallon d'aménagement du territoire defines: « a property, a site with different function from housing, requiring interventions of soils reclamation,, renovation, construction or reconstruction in order to restore the structure of the urban fabric according to a quality of urban spaces »*

(In 2014, 2213 SAR are present in Wallonia )



## Plan Marshall Wallonie

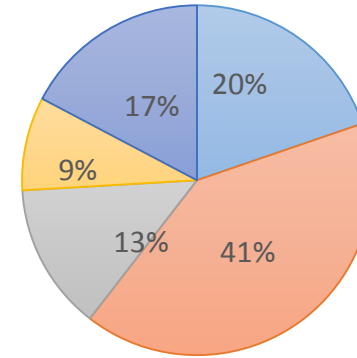
- Employment
- Industrial development with innovative techniques
- Territorial recovery strategies for new productive activities
- Energetic transition
- IT innovation

## Re development projects 2006-2016

n. 88 SAR have been selected to be recovered in Wallonie.

Main actors:

SPAQuE + DGO4



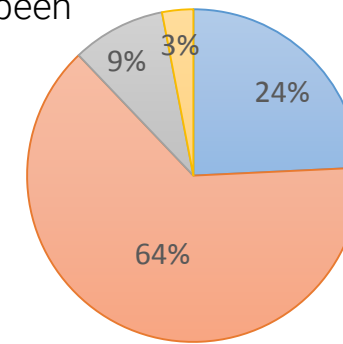
■ Liège ■ Hainaut ■ Namur ■ Brabant Wallon ■ Luxembourg

## Reclamation projects 2006-2016

n. 60 polluted sites have been reclaimed in Wallonie

Main actors:

SPAQuE + DGO3



■ Liège ■ Hainaut ■ Namur ■ Brabant Wallon





## Observations

- SAR are often polluted sites
- Depollution procedures depend on the future function of the site
- Economic redevelopment is the basic principle leading the reclamation of the site



## DEMOLITION AND SUBSTITUTION

- Expensive reclamation procedures in order to re-introduce quickly the property in the real estate market
- MASTERPLANS imposing fixed preconfigurations of new productive sites;
- Deleting a part of social history of the community
- Banalizing the landscape instead of working with its characters



## IS IT URBAN REGENERATION?





## Waste land VS waiting land

MAN, TECHNIQUE AND  
PRODUCTION OF PLACES

RECLAIMING LANDSCAPE IS:  
RECOVERING THE RELATIONSHIP  
BETWEEN MAN AND NATURE



1. What are the new techniques based on the co-action of ecological dynamics and human actions?
2. How can these techniques generate spatial quality? what are the possible configurations in a brownfield?
3. In what way can we integrate these « soft » regeneration techniques in a redevelopment program in Wallonie?



## ECO-LOGICS

Landscape approach as an interpretative tool for a territory in transformation:  
Eco\_logics accompanying the recovery process in a sustainable process

## LOCAL PROGRAMS AND PRACTICES

Main actors, experiences and practises for recovery / redevelopment programs in Wallonie

## PERSPECTIVES

Possibilities and limits in the application of landscape based solutions in recovery strategies in Wallonia





- Remediation based on topography
- Biostimulation



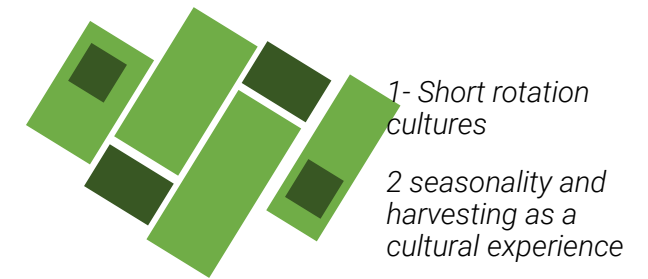
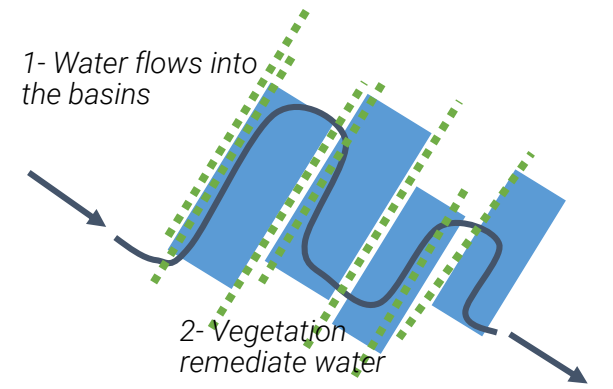
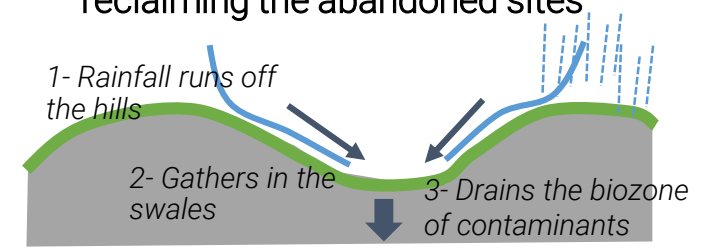
- Phytodepuration
- Phytoextraction



- Urban forest/ plantations :
- Combining biomass production and public space
  - Testing adaptation to climate change



**ECO-LOGICS**  
Nature as a new « machine »  
reclaiming the abandoned sites







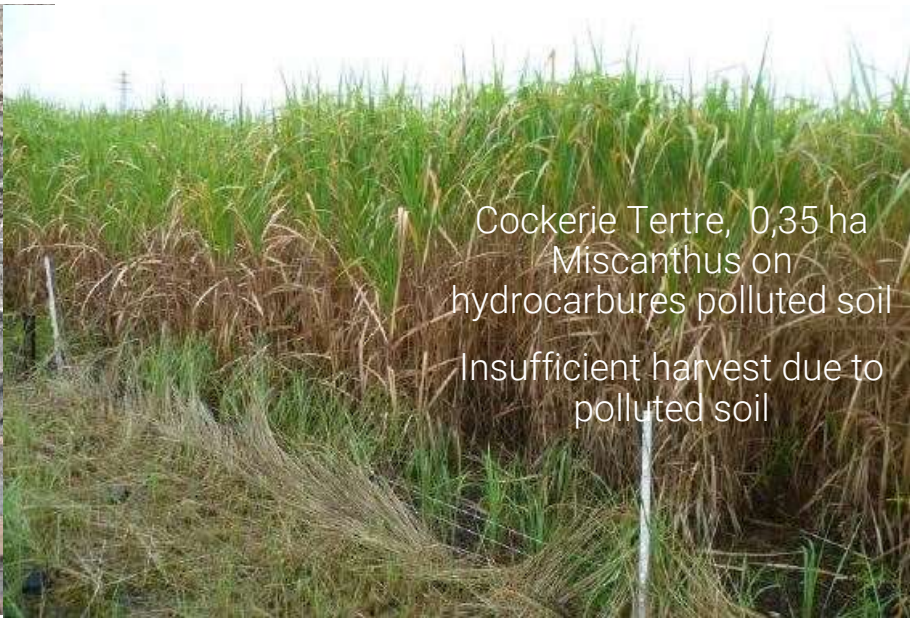
## ECO-LOGICS

### Cultural re-appropriation and new production

Hypothesis of re-appropriation activities given by a long term depollution strategy (Eco-logics):

- a) Studying environmental quality improvement by using bioremediation techniques IN SITU ( research centers)
- b) Cultural tourism attracted by the manufactured sites, where:
  - observe spontaneous vegetation and specific biotope generated by industrial site,
  - Rediscover the sites as potential spaces to be reuse for communities
- c) Promoting the development of new green spaces in urban areas
- d) Activating a new kind of production





Cockerie Tertre, 0,35 ha  
Miscanthus on  
hydrocarbures polluted soil  
Insufficient harvest due to  
polluted soil

LOCAL PROGRAMS AND PRACTICES:

SPAQuE

N.2 Experiences in **phytoremediation** with Miscanthus :

- a) *Cockerie Tertre*: testing the capacity of Miscanthus to grow in polluted soil
- b) *Vieille Montagne*: collaboration with UCL, testing heavy metal absorption capacity of Miscanthus in a sample of contaminated soil



Bois Sain Jean, 0,6 ha  
Miscanthus on  
a capping soil  
Good harvest

N. 2 Experiences in **biomass production** using Miscanthus

- a) *Bois Saint Jean*, testing the quality and quantity of biomass production on a reclaimed soil
- b) *Corderie Laurent* , testing the quality and quantity of biomass production on an industrial soil



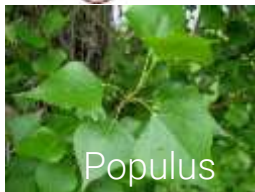
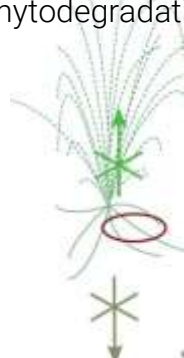
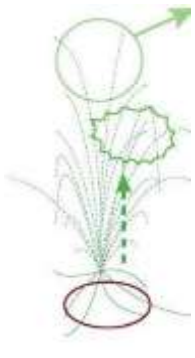
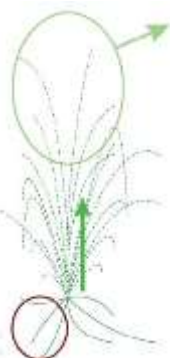
Oriented in Miscanthus biomass production in reclaimed soils



Phytoextraction

Phytostabilization

Rhyzo/  
phytodegradation



Populus



Miscanthus



Salix



Martinet, project of poplar trees plantation

## LOCAL PROGRAMS AND PRACTICES:

### Valbiom

N.1 Project in **phytoremediation** with Poplar trees :

- a) *Martinet*: testing the capacity of Poplar to reduce the contaminants in soil

The project started this year, so we don't have some datas yet



Water protection with miscanthus plantation

Projects in **environmental risk management** using Miscanthus

- a) Possible applications of Miscanthus are anti-erosion surfaces, protection of water in rural area, protection of sensitive places
- b) The biomass can be used as biofuel or stocked for eco-materials, or used as vegetable bed for animals

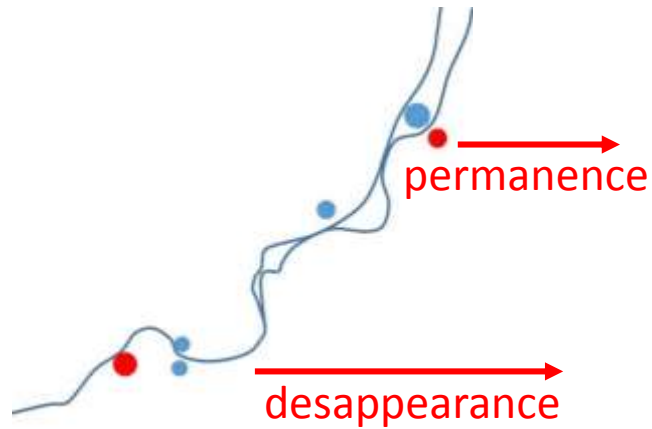
Projects in development



ECO-LOGICS



LOCAL PROGRAMS AND PRACTICES



Characters  
Ongoing Projets  
Perspectives

Characteres  
Ongoing Projets  
Perspectives

### What next/Perspectives

Continouing the research concerning local strategies and actors involved in recovery of industrial sites



Choosing two cases in the territory of Liège in order to compare the dynamics of transformation ( tabula rasa VS abandon)



Trying to study how to integrate landscape based solutions in both cases

## Labo Pay(s)age

This research belongs to research and teaching practices at the Labo Pay(s)age, at the Faculty of Architecture in Liège.

Territory is seen as a palimpsest to be monitored in its changes in time, and the project has the aim of accompany changes.

In both teaching and research methods the project is a medium, capable to raise attention of municipalites and to active a dialogue with local stakeholders in order to orient decisions about urban transformation.

The project, as a process, can really become a tool for a cultural reappropriation of the territory thanks to reflections and visions elaborated in collaborative action.

