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HOlistic Management of Brownfield REgeneration (HOMBRE)

Biomass Production on Brownfields

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Projektgruppe Stadt + Entwicklung

In cooperation with:

CABERNET www.cabernet.org.uk

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Making the Transition

HOMBRE WP 5

Task 5.3: „Use of bio-energy clusters for linking marginal urban brownfield site re-use with sustainable urban energy”

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Overview

- Brownfields and Biomass
- Research Approach
- Biomass Case Studies
- The HOMBRE Decision Tree for Biomass Production on Brownfield Sites
- Landscape Considerations
- Conclusions and Recommendations

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Brownfields and Biomass Production

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Brownfields and Biomass Production

- Synergies for biomass production on brownfields
  - Sustainable urban redevlopment
  - Creation of sustainable energy source
  - Community asset



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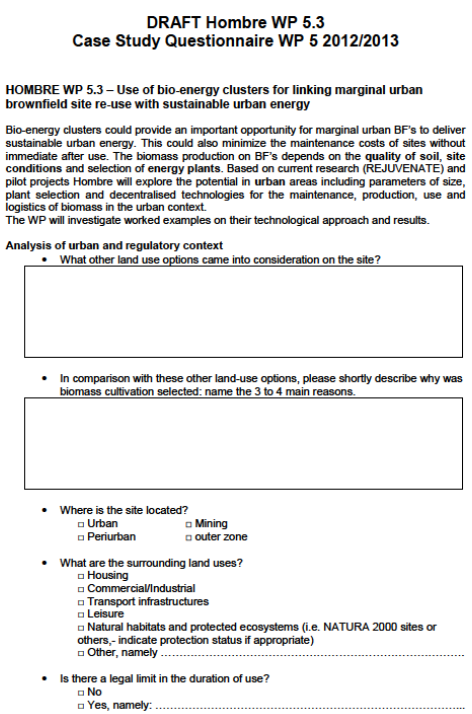
Research Approach

- Literature review
- Case studies
- Questionnaire
- Typology of brownfields

HOMBRE Questionnaire

- Analysis of the three case studies
  - Halle, Germany
  - Gelsenkirchen, Germany
  - Markham Willow, UK
- Questions to collect the project specificities



DRAFT Hombre WP 5.3
Case Study Questionnaire WP 5 2012/2013

HOMBRE WP 5.3 – Use of bio-energy clusters for linking marginal urban brownfield site re-use with sustainable urban energy

Bio-energy clusters could provide an important opportunity for marginal urban BF's to deliver sustainable urban energy. This could also minimize the maintenance costs of sites without immediate after use. The biomass production on BF's depends on the quality of soil, site conditions and selection of energy plants. Based on current research (REJUVENATE) and pilot projects Hombre will explore the potential in urban areas including parameters of size, plant selection and decentralised technologies for the maintenance, production, use and logistics of biomass in the urban context.
The WP will investigate worked examples on their technological approach and results.

Analysis of urban and regulatory context

- What other land use options came into consideration on the site?

- In comparison with these other land-use options, please shortly describe why was biomass cultivation selected: name the 3 to 4 main reasons.

- Where is the site located?
  - ▫ Urban
  - ▫ Periurban
  - ▫ Mining
  - ▫ outer zone
- What are the surrounding land uses?
  - ▫ Housing
  - ▫ Commercial/Industrial
  - ▫ Transport infrastructures
  - ▫ Leisure
  - ▫ Natural habitats and protected ecosystems (i.e. NATURA 2000 sites or others,- indicate protection status if appropriate)
  - ▫ Other, namely .....
- Is there a legal limit in the duration of use?
  - ▫ No
  - ▫ Yes, namely: .....

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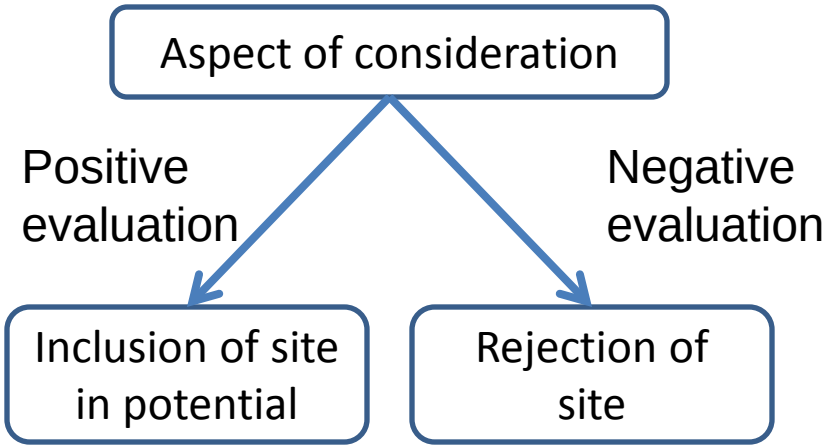
Biomass Case Studies

HOMBRE Decision Tree

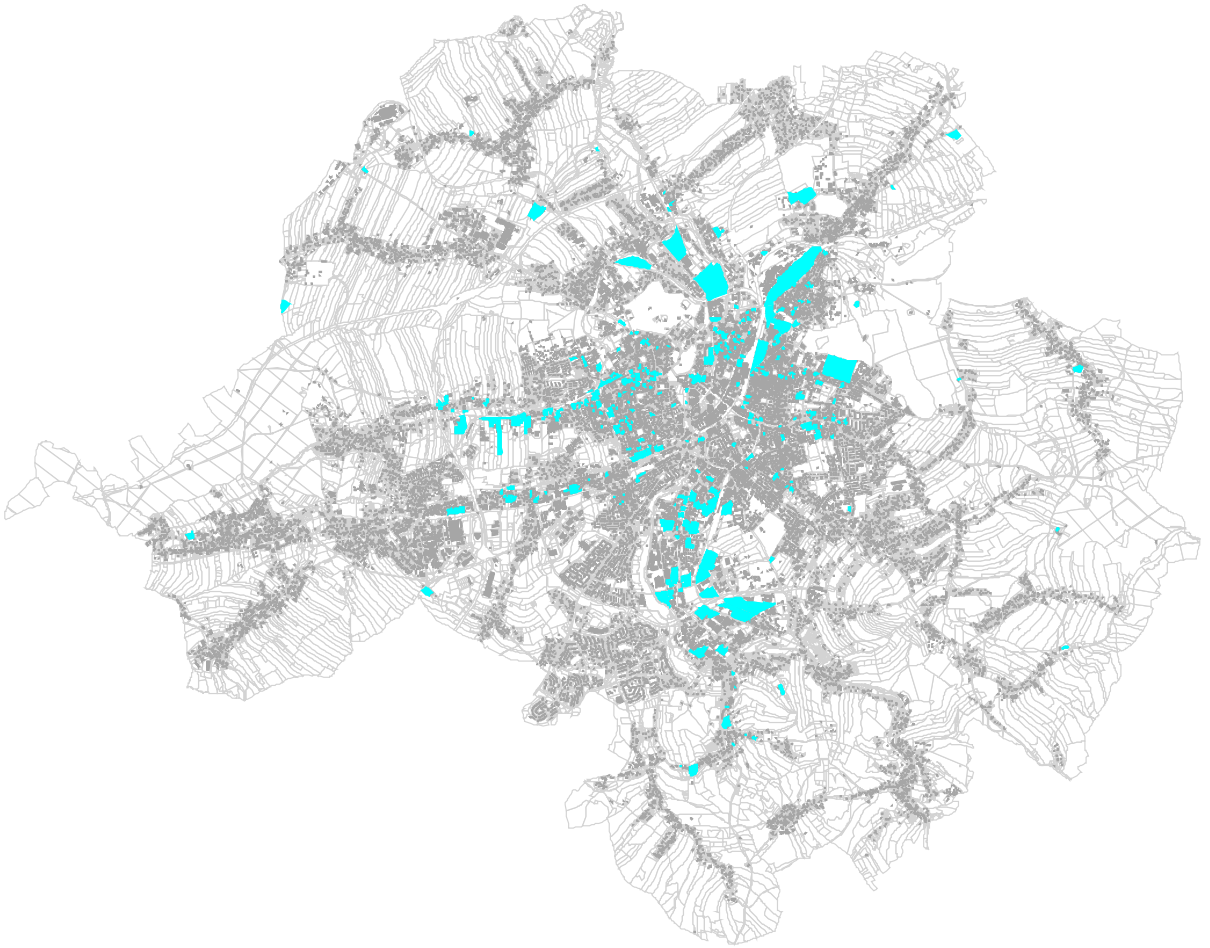
- Decision tool: establish relations between relevant criteria for project feasibility
  - Systematic identification of priority sites
  - In planning systems and processes do not generally consider the potential of sites for biomass



Example: Brownfield Sites in Chemnitz

1: Status quo

About 500 brownfields with about 355 ha



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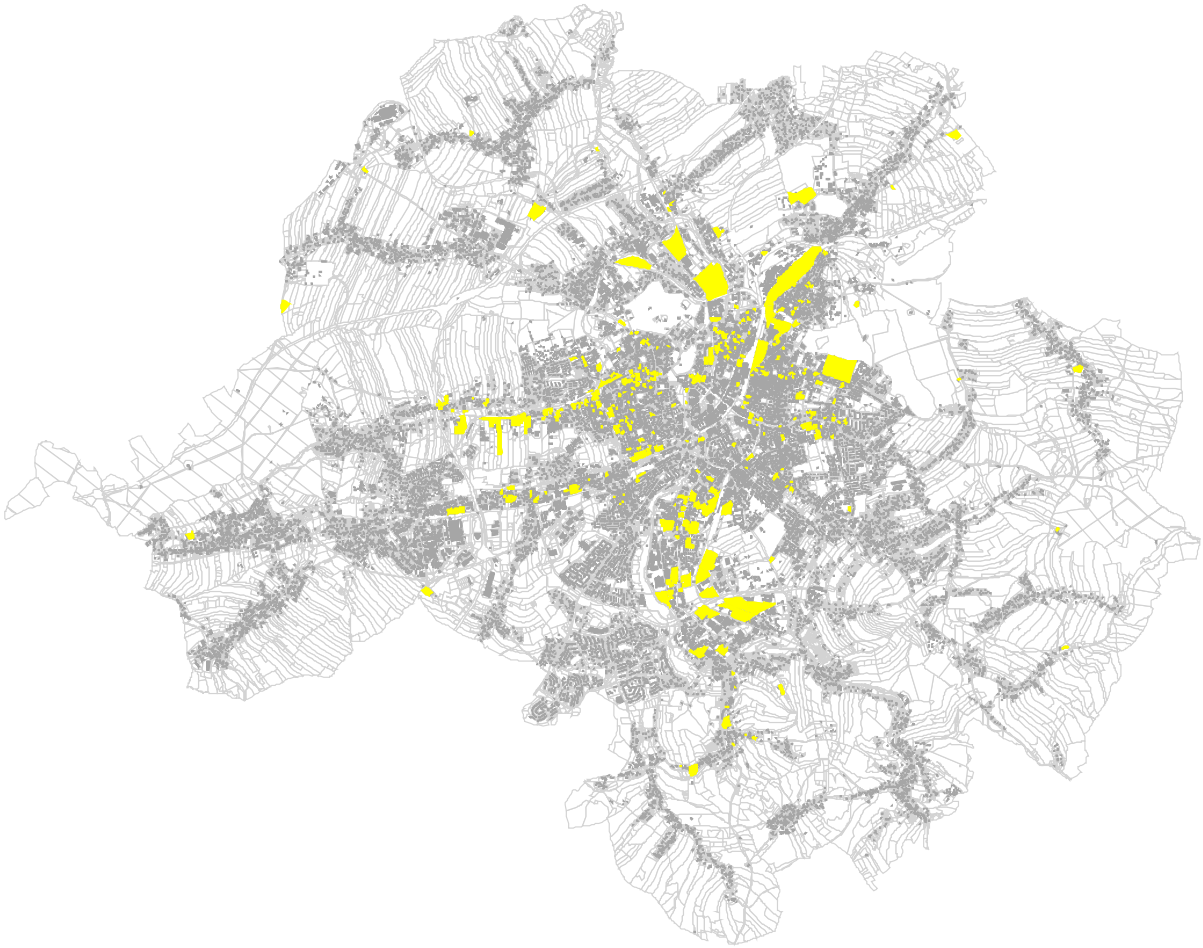
Example: Brownfield Sites in Chemnitz

2: Sites meeting a minimum size of 500 m^2

About 400 brownfields with about 350 ha



Example: Brownfield Sites in Chemnitz

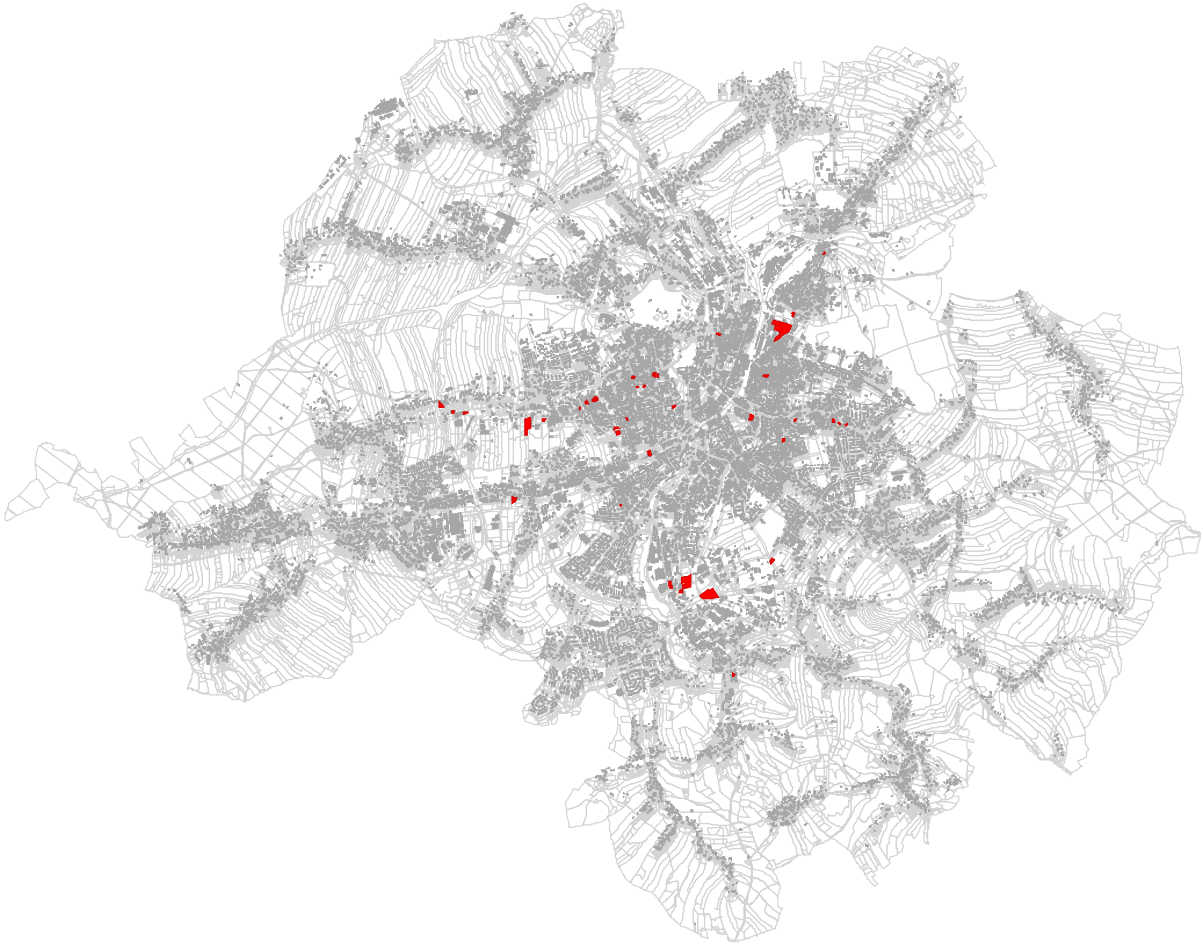
3: Undeveloped sites which are unsealed or partially sealed

About 53 brownfields with about 47 ha

Example: Brownfield Sites in Chemnitz

4: Unsealed brownfields

About 46 brownfields with about 27 ha



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HOMBRE Decision Tree

Main Category	Sub-category	Key criteria
Theoretical Potential	Size	Is the land larger than 1 ha in size?
Technical Potential	Soil	Is the soil natural or disturbed?
		Is there contamination?
		Is the soil sealed?
Restrictions	Legal	Are there any legal restrictions?
	Planning	Are there any planning restrictions?
Implementation	Intent of the owner	Is the owner willing to allow biomass cultivation on site
	Duration	Is there a likely hard urban use for the site within the next 10 years?

HOMBRE Decision Tree

- Theoretical Potential:
  - Size of the brownfield must be larger than 1 ha in size
    - Reaching economic feasibility
    - Clustering potential

Vs.

HOMBRE Decision Tree

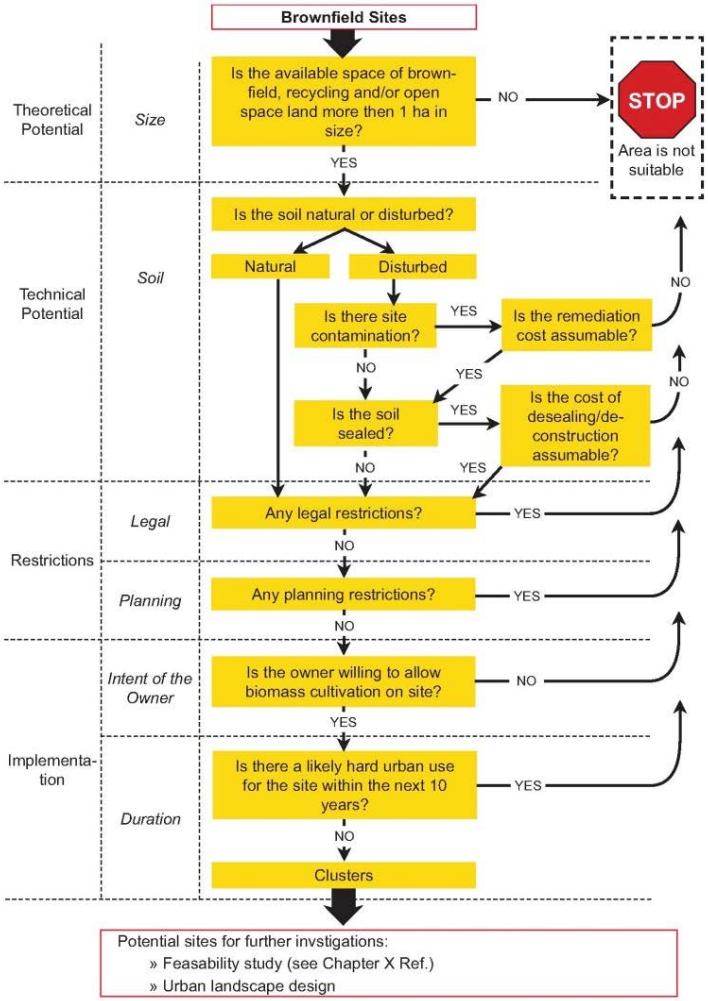
- Technical Potential
  - Has the soil been disturbed? If so, in what manner?
    - Assurance of suitable crop production conditions
    - Issues of contamination
    - Economic remediation cost must be assumable for the size of production

HOMBRE Decision Tree

- Legal and planning restrictions
  - Nature conservation designations (EU-wide Floura-Fauna-Habitat)
  - Monument conservation
  - Land use designation
  - Urban farming regulations
- Implementation
  - Intent of the owner (hard vs. soft uses)
  - Duration: 10 years minimum for a profitable operation
  - Clustering for the achievement of the minimum plot size requirement

HOMBRE Decision Tree

- Provides stakeholders a quick means to consider all relevant aspects of decision making
- More information:
  - HOMBRE Deliverable 5.3



HOMBRE Decision Tree

- Testing in the City of Cottbus, Germany
- Initial: 152 brownfields total
  - Theoretical: 68 potential sites
  - Technical: 41 potential sites
  - Restrictions and implementation: 14 potential sites
- The final 14 can be the concentrated efforts of city planning intervention!

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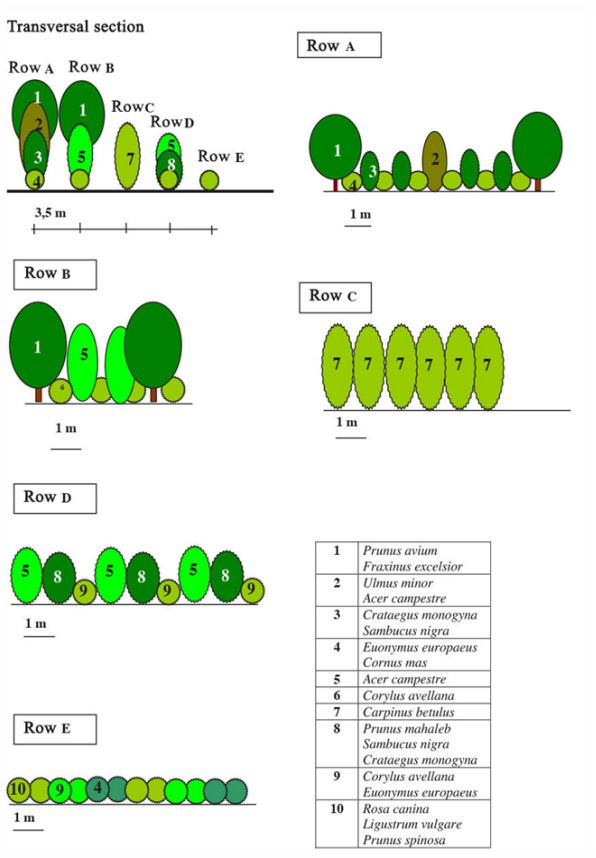
Landscape Design



1	*Prunus avium* *Fraxinus excelsior*
2	*Ulmus minor* *Acer campestre*
3	*Crataegus monogyna* *Sambucus nigra*
4	*Euonymus europaeus* *Cornus mas*
5	*Acer campestre*
6	*Corylus avellana*
7	*Carpinus betulus*
8	*Prunus mahaleb* *Sambucus nigra* *Crataegus monogyna*
9	*Corylus avellana* *Euonymus europaeus*
10	*Rosa canina* *Ligustrum vulgare* *Prunus spinosa*

- Important for the aspects:
  - Economic viability
  - Improve landscape image
  - Increase biodiversity
  - Facilitate social inclusion
  - Recreational services

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Conclusions and Recommendations

- Biomass cultivation on brownfield sites can:
  - Improve community image,
  - Reduce impact of brownfields on the identity of a community
  - Engage community with new jobs and uses
- Community sensitivity must be properly understood at an early stage of project planning

Conclusions and Recommendations (cont.)

- The HOMBRE decision tree identifies potential sites, but local planning defines what is allowed:
  - Project managers should adapt their projects to local regulations and strategic orientations as much as possible
- Economic viability:
  - Clustering as an additional alternative to attain minimum site size requirement for profitable yield
  - Reduction of the maintenance cost of a brownfield site can also be a source of profit for biomass production

Conclusions and Recommendations (cont.)

- Environmental aspects of biomass production on brownfields
  - Issues such as pesticide and fertilizer use in urban areas need to be thoroughly studied to ensure no externalities
  - Site can provide storm water run-off catchment
  - Soil functions normalize on brownfields converted to biomass production sites
  - Improvement of the urban micro-climate (increased shade, respiration)

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Biomass on Brownfields

Thank you for your attention!